THE LANCET

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

Telegrams—LANCET, WESTRAND LONDON *Telephones*—GERRARD 4314 & 4315 *Offices*—423, Strand, London, W.C.2

No. IV. OF VOL. I., 1926. LONDON, SATURDAY, JANUARY 23, 1926. Pp. 112—Price 1s.
No. 5343. Vol. CCX. Founded 1823. Registered as a Newspaper. Published Weekly. Annual Subscription Inland £2 2s. Abroad £2 10s.

OXFORD MEDICAL PUBLICATIONS.

SEE PAGE 4.

ON THE BREAST.

By DUNCAN C. L. FITZWILLIAMS, C.M.G., M.D., Ch.M., F.R.C.S. Ed. and Eng.

Royal 8vo. 456 pp. 2 Plates, 166 Illustrations. 30s. net.

LANCET.—"The book is packed with accurate clinical observations and bears evidence throughout of extensive clinical experience and wide reading on the part of the author."

Wm. Heinemann (Medical Books) Ltd., 20, Bedford-street, London, W.C.2.

THE STOMACH

AND UPPER ALIMENTARY CANAL IN HEALTH AND DISEASE.

By T. IZOD BENNETT, M.D., M.R.C.P.

Demy 8vo. Illustrated. 21s. net.

LANCET:—"The book has no English competitor at the present time, and well-earned success may be anticipated for the volume." UNIV. OF DURHAM COLLEGE MED. GAZETTE:—"We can strongly recommend this volume as an authoritative guide to diagnosis and treatment."

Wm. Heinemann (Medical Books) Ltd., 20, Bedford-street, London, W.C.2.

NOW READY. EIGHTH REVISED EDITION.

STEDMAN'S MEDICAL DICTIONARY

(ILLUSTRATED).

Quarto. Bound in limp leather, gilt, with thumb-cut index. Pp. xii + 1146, with 15 Plates and about 400 other illustrations. Price 35s., postage 1s.

Baillière, Tindall & Cox, 8, Henrietta-st., Covent Garden, W.C.2.

NOW READY. FIFTH EDITION. Royal 8vo. Pp. xv + 633, with 162 Illustrations. Price 30s., postage 1s.

DISEASES OF INFANTS AND CHILDREN.

By H. D. CHAPIN, M.D., Emeritus Prof. of Med., New York Post-Graduate Med. School and Hosp., and L. T. ROYSTER, M.D., Prof. of Pediatrics, Univ. of Virginia.

Baillière, Tindall & Cox, 8, Henrietta-st., Covent Garden, W.C.2.

STERILITY IN WOMAN:

ITS CAUSES AND TREATMENT.

By ROBERT A. GIBBONS, M.D., F.R.C.S.E., Gynæcologist to the Grosvenor Hospital for Women.

"It is written clearly, and should make a special appeal to the general practitioner . . . . . We can heartily recommend this useful and well-written book."—THE LANCET.

"The volume provides an admirable account of the whole subject. It is sufficiently full for the needs of the family practitioner, and is written in a refreshingly clear and lucid style."

—BRITISH MEDICAL JOURNAL.

With 44 illustrations, 12s. 6d. J. & A. Churchill, 1923.

MODERN TECHNIQUE IN TREATMENT.

VOLUME ONE. PRICE 10s. 6D. NET.

PUBLISHED BY *The Lancet*, 1, Bedford-street, London.

Agents for India: Butterworth & Co.

SYPHILIS AND VENEREAL DISEASES.

By C. F. MARSHALL, M.Sc., M.D., F.R.C.S.Eng.; and E. G. FFRENCH, M.D., F.R.C.S. Edin., M.R.C.P. Lond., Lieut.-Col. R.A.M.C. (Ret.), late O.C. Military Hospital, Rochester Row, S.W.

Fourth Edition, revised and illustrated with 7 Coloured Plates and numerous Figures. Price 15s.

London: Baillière, Tindall & Cox, 8, Henrietta-st., Covent Garden.

With 79 Illustrations on 40 Plates and 1 Text-figure. Demy 8vo. 12s. 6d. net; postage 6d.

INTERNAL DERANGEMENTS OF

THE KNEE-JOINT.

THEIR PATHOLOGY AND TREATMENT BY MODERN METHODS.

By A. G. TIMBRELL FISHER, M.C., F.R.C.S. Eng.

"Throughout the book there is evidence of exhaustive investigation by the judicial mind of a trained surgeon of wide experience. We cannot speak too highly of this valuable contribution to medical literature."—Extract from *Archives of Surgery*, Chicago.

London: H. K. Lewis & Co. Ltd., 136 Gower-street, W.C. 1.

Now Ready. With 62 Illustrations. Demy 8vo. 7s. 6d. net; postage 5d.

MANIPULATIVE SURGERY.

PRINCIPLES AND PRACTICE.

By A. G. TIMBRELL FISHER, M.C., F.R.C.S.Eng.

"The book should be of value to all who have to deal with injuries of the joints."—LANCET.

London: H. K. Lewis & Co. Ltd., 136 Gower-street, W.C. 1.

JUST ISSUED.

PALFREY'S

THE ART OF MEDICAL TREATMENT.

See Saunders' Advt. on Page 5.

BY LIEUT.-COL. ROBERT HENRY ELLIOT, M.D., B.S. Lond., F.R.C.S. Eng., I.M.S. retd.

A TREATISE ON GLAUCOMA.
2nd Edition, Revised and Enlarged. 30s. net.

TROPICAL OPHTHALMOLOGY.
With 7 Plates and 117 Illustrations. 31s. 6d. net.
Spanish and French Editions, 1922.

THE CARE OF EYE CASES: 12s. 6d. net.
A MANUAL FOR NURSES, PRACTITIONERS, AND STUDENTS.
Oxford University Press.

GLAUCOMA: 4s. net.
A HANDBOOK FOR THE GENERAL PRACTITIONER.

THE INDIAN OPERATION OF COUCHING FOR CATARACT.
7s. 6d. net. H. K. Lewis and Co. Ltd.

CANCER OF THE RECTUM:

ITS PATHOLOGY, SYMPTOMATOLOGY AND TREATMENT.

BEING THE LETTSOMIAN LECTURES FOR 1923.

By W. ERNEST MILES, F.R.C.S.

80pp and 33 plates bound. Cloth Price 7s. 6d. net, post free 7s 10d.

Harrison & Sons, Ltd., 44, St. Martin's Lane, London, W.C.2.

Just Published. 8vo. Cloth. Price 5s. net.

MENTAL INVALIDS.

Being the Morison Lectures delivered before the Royal College of Physicians of Edinburgh in June 1925.

By

C. C. EASTERBROOK, M.A., M.D., F.R.C.P.E., Physician-Superintendent, Crichton Royal, Dumfries.

Oliver and Boyd
Edinburgh: Tweeddale Court
London: 33, Paternoster Row, E.C.

MEDICAL WHO'S WHO 1925.

Few remaining copies 15s., post free.
1926 Edition ready February. 30s. post free.
Grafton Publishing Co. Ltd., 8, Stone Bldgs., Lincoln's Inn, W.C.2.

Schering

Fine Products from the Schering Laboratories.

ATOPHAN

TRADE MARK

IN

GOUT AND RHEUMATISM.

In these diseases Atophan acts in the following manner:—

(1) **As a uric acid eliminant,** it increases the amount of uric acid excreted in the urine from 100—300 %.

(2) **As an analgesic,** it relieves the pain.

(3) **As an antiphlogistic,** it arrests all inflammatory processes.

(4) **As an antipyretic,** it reduces febrile conditions.

(5) **Uratic deposits** are softened and removed.

These properties, each supplementing the other, mark Atophan as the outstanding remedy in the treatment of the above-named diseases.

Samples and Literature on request from

SCHERING, LTD.,

3, Lloyd's Avenue, LONDON, E.C.3

Other Schering Specialities.

ARCANOL.—A combination of Atophan and Acid Acetyl Sal. In this preparation the powerful antiphlogistic (anti-inflammatory) properties of Atophan are supplemented by the active antipyretic action of Acid Acetyl Sal.

If given at the onset, Arcanol will, in the majority of cases arrest an attack of influenza within 24 hours. It is equally effective in diseases associated with chill especially those of the upper respiratory tract.

VERAMON.—A safe and potent analgesic which is "second only to morphia" in pain relieving properties with none of the secondary symptoms of that drug.

Veramon will relieve "all possible forms of painful conditions" ranging from headache and toothache to tabetic crises usually without inducing sleep.

MEDINAL.—A readily soluble, safe and non-habit forming hypnotic and sedative for internal, rectal and subcutaneous administration.

The sleep produced by Medinal approaches natural sleep in its refreshing character and peacefulness.

Medinal was specially recommended by several speakers of eminence in the discussion on Insomnia at the Annual Conference of the B.M.A., at Bath 1925.

VALENTINE'S
PREPARATION
MEAT JUICE.
The result of an original Process of Preparing Meat, and extracting its Juice by which the elements of nutrition are obtained in a state, ready for immediate absorption.
DIRECTIONS—Dissolve one teaspoonful of the Preparation in two or three tablespoonfuls of cold or warm water. The use of boiling water changes the character of the preparation.

Valentine's Meat-Juice

In **Hospital** and **Private Practice** during **Epidemics** and **in their own persons** when ill, **Physicians** have demonstrated the **Value** of **Valentine's Meat-Juice** in **Sustaining** and **Strengthening** the weakened **Vital Forces.**

Pneumonia *and* Influenza.

Cavalier Dr. Enrico Ballerini, *Late Surgeon to the Hospital of Rome, Italy:* "I have used VALENTINE'S MEAT-JUICE in the treatment of patients and also personally after having been ill with Influenza, and I must say it is an excellent tonic in conditions of great organic weakness. I have prescribed it with the greatest satisfaction for convalescents and invalids restricted to a liquid diet."

Edward C. Seufert, M.D., *Professor Histology and Pathology, Illinois Medical College, Chicago:* "I have always been a user of the valuable preparation, VALENTINE'S MEAT-JUICE. The best results that I have obtained from it have been in Typhoid Fever and Broncho-Pneumonia of Children. I believe that the samples sent helped to save the child of one of my students at the College."

For sale by European and American Chemists and Druggists.

VALENTINE'S MEAT-JUICE COMPANY.

RICHMOND, VIRGINIA, U.S.A.

D 175

THE LANCET

No. 5343. LONDON, SATURDAY, JANUARY 23, 1926. CCX.

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

AN ADDRESS on the Major Problem of Puerperal Sepsis. By VICTOR BONNEY, M.S., M.D., B.Sc., F.R.C.S. 165

ORIGINAL ARTICLES.

The Treatment of Acute Bacterial Infections with Intravenous Injections of Perchloride of Mercury and Mercurochrome. By Prof. LEONARD S. DUDGEON, C.M.G., F.R.C.P. 169

Determination of the Basal Metabolic Rate. By T. C. HUNT, B.A. 172

Blood Transfusion. A Plea for the Defibrination Method. By ROBERT PLATT, M.D., M.R.C.P. —(*Illustrated*) 173

A Blood Transfusion Apparatus, Introducing the Use of "Record" Syringe Needles both for the Donor and the Recipient. By H. H. MOLL, M.D., M.R.C.P.—(*Illustrated*) 175

Erythrœdema or Pink Disease. By C. P. LAPAGE, M.D., F.R.C.P. 176

CLINICAL AND LABORATORY NOTES.

A Case of Aneurysm of a Sinus of Valsalva Bursting Externally. By J. H. SHELDON, M.D., M.R.C.P. 178

Familial Neuro-Syphilis with Apparently Healthy Parents. By A. G. DUNCAN, M.D. 179

MEDICAL SOCIETIES.

Incorporated Association of Hospital Officers: Nationalisation of Hospitals 180

Society of Superintendents of Tuberculosis Institutions: Occupational Therapy 182

Medico-Legal Society: The Excretion of Alcohol in Urine as a Guide to Alcoholic Intoxication .. 207

REVIEWS AND NOTICES OF BOOKS.

L'Oxyde de Carbone et l'Intoxication Oxycarbonique. By Prof. Maurice Nicloux 183

The Call of the Child. By A. Dingwall-Fordyce, M.D., F.R.C.P. 184

Clinical Study and Treatment of Sick Children. By John Thomson, M.D., F.R.C.P. 184

Feeding and the Nutritional Disorders in Infancy and Childhood. By Julius H. Hess, M.D. 184

Simplifying Motherhood. By F. H. Richardson, M.D. 184

A Text-book of Pharmaceutical Chemistry. By Arthur Owen Bentley, Ph.C., and John Edmund Driver, M.Sc. 184

LEADING ARTICLES.

TRANSFUSION OF BLOOD .. 185

MEDICAL RESEARCH IN 1925 185

CARBON MONOXIDE POISONING 186

A CASE FOR CLEMENCY 187

ANNOTATIONS.

Drunk or Sober? 188

The Need for Special Hospitals 188

Lead and Arsenic in Tartar Emetic 188

Twenty Years of Sanatorium Work in France . 189

The East African Medical Service 189

The Problem of the Mongol 190

Insurance for Education .. 191

A Variolous Story 191

The National Institute for the Deaf 191

Vital Statistics for England and Wales during 1925 .. 192

MODERN TECHNIQUE IN TREATMENT.

CLVII.—The Treatment of Salpingitis. I. Acute Salpingitis. By THOS. G. STEVENS, M.D., B.S., F.R.C.S. 192

SPECIAL ARTICLES.

The Presence of Lead and Arsenic in Tartar Emetic. By E. GRIFFITHS-JONES, M.Sc., A.I.C. 194

Report of the Medical Research Council, 1924–25.—(*To be continued*) 195

Paris: Tetanus Anatoxin. — Proposed Insurance Legislation 197

Berlin: Professional Secrecy 198

Ireland: The School of Physic, Trinity College .. 199

PUBLIC HEALTH SERVICES.

Mental Hospital Reports .. 200

Infectious Disease in England and Wales 201

THE SERVICES.

Small-pox Arena. — Royal Naval Medical Service.—Royal Army Medical Corps.—Royal Air Force. —Indian Medical Services 201

CORRESPONDENCE.

Acute Hæmorrhagic Nephritis (Dr. J. N. Cruickshank) 202

Intra-Urethral Negative Pressure during Coitus (Mr. H. Wansey Bayly). 202

The Treatment of Human Anthrax (Dr. L. P. Gibson) 203

Instrumental Midwifery (Dr. J. Hargreaves Robinson) 203

Professional Criticism of the General Medical Council (Mr. T. B. Layton) 203

Glycosuria and Life Assurance (Dr. Arthur T. Davies) 203

The Twort-D'Herelle Phenomenon (Drs. André Gratia and Bernice Rhodes) 204

Medical Services to Industrial Firms 205

INDEX NOTICE.

THE LANCET, Vol. II., 1925 192

OBITUARY.

George Herbert Hunt, M.D., F.R.C.P.—(*With portrait*) 205

John Basil Hall, M.B., F.R.C.S., J.P. 206

William John Naismith, M.D., F.R.C.S. 207

Edward Granville Browne, M.B., F.R.C.P. 207

MEDICAL NEWS.

University of London 209

Royal College of Surgeons of England 209

Bradford Hospitals 172

A Glasgow Nursing Home 193

Fellowship of Medicine and Post-Graduate Medical Association 194

Liverpool Heart Hospital 199

Glasgow Royal Infirmary . 201

The late Dr. W. P. Hilliam 205

The late Dr. George Chapman 207

Study of Venereal Diseases 209

Hunterian Society 209

New Union Hospital for Barton 209

German Congress on Psychotherapy 209

Royal Medical Benevolent Fund 209

A Hospital Economy 210

Norfolk and Norwich Hospital 210

Richmond Hospital Association 210

Improvements at Cheltenham General Hospital .. 210

Carter Bequest Hospital, Middlesbrough 210

Yorkshire Cancer Campaign 210

Courses at Maudsley Hospital 210

A British Trust for Spahlinger Treatment .. 210

Charing Cross Hospital Institute of Pathology .. 210

NOTES, COMMENTS, AND ABSTRACTS.

Small-pox and Variolation in a Village in Palestine in December, 1921. By JOHN MACQUEEN, M.B., C.M.—(*Illustrated*) 212

The Doctor's Car: An Income-tax Snag 214

The Golf Swing 214

White Wine Anaphylaxis .. 214

Medical Diary 210

Appointments, Vacancies 211

Births, Marriages, Deaths 211

NEW BOOKS AND NEW EDITIONS

SWANZY'S DISEASES OF THE EYE AND THEIR TREATMENT. Revised and Edited by **LOUIS WERNER**, M.B., F.R.C.S.I., &c. Thirteenth Edition, with 9 Coloured Plates and 278 Text Illustrations. Demy 8vo. **21s.** net, postage 9d.

CHRONIC INFECTION OF THE JAWS. A SHORT RADIOLOGICAL AND CLINICAL STUDY. By **STANLEY COLYER**, M.D. (Lond.), M.R.C.P., D.M.R.E. With 26 Illustrations on 19 Plates. Demy 8vo. **10s. 6d.** net, postage 6d.

AN INTRODUCTION TO FORENSIC MEDICINE. For Medical Students and Practitioners. By **H. A. BURRIDGE**, M.A., M.B. Crown 8vo. **10s. 6d.** net, postage 6d.

THE PATHOLOGY OF TUMOURS. By **E. H. KETTLE**, M.D. Second Edition. Thoroughly revised and largely re-written. With new Illustrations. Demy 8vo. **12s. 6d.** net, postage 6d.

PUBLIC HEALTH LABORATORY WORK (CHEMISTRY). By **H. R. KENWOOD**, C.M.G., M.B., D.P.H., F.C.S. Eighth Edition. Six Plates and other Illustrations. Demy 8vo. **12s. 6d.** net, postage 9d.
[*Lewis's Practical Series.*

THE BACTERIOLOGY OF FOOD. By **CUTHBERT DUKES**, M.D., M.Sc., D.P.H. With 25 Illustrations. Demy 8vo. **7s. 6d.** net, postage 6d.

LONDON: H. K. LEWIS & CO. LTD., 136 Gower Street, W.C. 1.

TERAPIA CONTEMPORANEA.

International Review of Therapeutics.

New Monthly Journal, edited with the collaboration of the most prominent University Professors of all Countries.

Presidents: Senator G. PASCALE, Naples, and Privy Councillor G. KLEMPERER, Editor of the "Therapie der Gegenwart" ("Modern Therapeutics"), Berlin.

Collaborators: 250 ITALIAN and FOREIGN PROFESSORS.

Original articles from the most important Clinics, Laboratories and large International Institutes, records of all advances in the whole domain of Medicine, reports of Congresses, Reviews of Books, etc.

Supplement: **Therapeutics of Infectious Diseases.**

Annual Subscription: ITALY - - - **Lire 70.** ABROAD - - **Lire 100.**

Bankers: Credito Italiano, Naples.

Offices: **GALLERIA UMBERTO I., No. 38, NAPLES.**

Sole Advertising Agents: RUDOLF MOSSE, — — — — Zürich, and Branches.

SURGERY: 100 Years Ago.

By **Professor C. B. TILANUS.** Translated by **JOSEPH BLES.** **6s.** net.

A collection of letters describing operations performed by great Continental surgeons such as Dupuytren and Larrey—before the use of anæsthetics and antiseptics.

GEOFFREY BLES, 22 Suffolk Street, Pall Mall, S.W.1.

STAMMERING, SPEECH DEFECTS.

BEHNKE METHOD. Estab. 1882. CASES, non-resident, treated at 39, Earl's Court Square, S.W.5, and, in residence, in the Summer holidays at Miss Behnke's house on the Chilterns.

"Pre-eminent success in the education and treatment of stammering and other speech defects."—*The Times.*

"Thoroughly physiological principles."—*The Lancet.*

"The method is scientifically correct and perfectly effective." *Guy's Hospital Gazette.*

STAMMERING, CLEFT PALATE, SPEECH, LISPING." **3s. 9d.** of Miss BEHNKE, 39, Earl's Court Square, S.W.5.

STAMMERING

W. J. KETLEY, "Tarrangower," Brondesbury, N.W.6

(Telephone: Willesden 435.)

30 years colleague of late B. BESLEY, Brampton Park, Huntingdon.

Those interested in the subject should write for his book, which will be sent post free.

STAMMERING

MOST SUCCESSFULLY TREATED.

RESIDENT AND DAILY PUPILS.

PROSPECTUS AND MEDICAL OPINIONS POST FREE FROM **Mr. A. O. SCHNELLE,** [Tel.: Museum 3668

Estd. 1905] **119, Bedford Court Mansions, London, W.C.1.**

TRUSS MAKERS.

MATTHEWS BROS., 10, New Oxford Street, London, W.C.1

Established 1840. Telephone: Museum 1017.

PERSONAL ATTENTION GIVEN TO ALL CASES.

DIFFICULT CASES A SPECIALITY

DISPENSING BOTTLES

MEDICAL FLATS, VIALS, POISONS, ETC.

Good Quality, Accurate Measure

at

LOWEST REDUCED PRICES

Prompt attention to Country Orders.

PRICE LIST SENT ON APPLICATION

ESTABLISHED 100 YEARS

I. ISAACS & CO.

NORTH LONDON GLASS BOTTLE COMPANY

London Office: 106, MIDLAND ROAD, N.W. 1.

Warehouse and Stores: London Midland & Scottish Railway Goods Depot St. Pancras.

Telephone: Museum 4200. *Telegrams:* Isaglasbot, Kincross, London.

An Address

ON THE

MAJOR PROBLEM OF PUERPERAL SEPSIS.

Delivered on Dec. 10th, 1925, before the Windsor and District Medical Society

BY VICTOR BONNEY, M.S., M.D., B.Sc. LOND., F.R.C.S. ENG.,

ASSISTANT GYNÆCOLOGICAL SURGEON TO MIDDLESEX HOSPITAL; SURGEON TO CHELSEA HOSPITAL FOR WOMEN, ETC.

THE subject of the prevention of puerperal sepsis is of constant interest because, sooner or later, the majority of medical men come face to face with the disease. At intervals this interest is exacerbated by the written or spoken pronouncements of some obstetrical authority, and a series of letters appear in one of the medical journals written by correspondents mostly holding different views. Meantime the disease remains with us, not greatly diminished in frequency for the last 50 years in spite of a great deal of not entirely unacrimonious discussion. This is the outstanding fact, the failure to explain which keeps professional interest in the subject always simmering.

We know that puerperal sepsis is due to infection of the placental site and that the organism most frequently found is a streptococcus belonging to the hæmolytic group and most often identical with *S. pyogenes*. The question is, how did it get there?

EXTRINSIC INFECTION.

The conveyance of organisms from individual to individual is the most easily understood method of producing sepsis, and as such was naturally the first to be discovered. As regards puerperal fever, Charles White, of Manchester, first of all, and Semmelweiss after him, recognised that the epidemics that ravaged lying-in hospitals were due to infection of the recently delivered woman from an outside source, although they were ignorant of the exact nature of the infection. The discoveries of Lister made clear that the infection was organismal, but the idea that the source of the infection was invariably an extrinsic one was maintained for many years after, and is only to-day being superseded by a wider view. There is no wonder in this, for Lister himself at first regarded wound infection as being almost entirely of extrinsic origin and chiefly air-borne. Increasing knowledge showed that in certain kinds of wound infection the organisms did not originate from without but were resident in the individual before the receipt of the wound. This was recognised in general surgical practice much sooner than in obstetric work, because the surgeon is frequently called upon to operate on tissues or surfaces obviously infected or even inflamed before he makes his wound, whereas the obstetrician works through a canal which, together with its approaches, usually appears healthy although it may in reality be gravely infected. So soon as surgeons began to frequently operate on the intestine, the throat, the nose, or other heavily infected surfaces, it became clear that the original antiseptic technique of Lister, which had for its object the prevention of extrinsic infection, was inadequate to prevent the wounds going wrong, since they became infected from the organisms already present in the part. Surgical technique has, therefore, been modified to meet this second source of infection as well, but the problem it presents is far more difficult of solution than that presented by the earlier recognised extrinsic infection, and, indeed, is only partly solved at the present day.

The maintenance of belief in extrinsic infection as the chief cause of puerperal sepsis is largely due to the dramatically rapid disappearance of the disease in its epidemic form, which at once followed the application of the Listerian principles to obstetrics. Such epidemics were certainly due to extrinsic infection, but that the patients so infected only formed a small proportion of the total number of cases of puerperal sepsis is obvious from the fact that, in spite of the abolition of epidemics, the yearly total of cases in the country has diminished relatively little in spite of the general employment of antiseptic measures—rubber gloves, for example—quite sufficient to make extrinsic infection extremely unlikely, if not to rule it out altogether. The finding of the specific cure of any disease or condition is immediately followed by unmistakable and striking results. The discovery of extrinsic organismal infection and the antiseptic measures for preventing it at once transformed surgery, because before Lister's day the majority of surgical cases "went wrong" because of extrinsic infection. Take, for instance, the operation of opening the knee-joint, which before Lister's time was almost uniformly fatal and now is performed with impunity. Infection of surgical wounds still occurs, of course, though with much lessened frequency, because although extrinsic infection has been rendered very unlikely the safeguards against intrinsic infection still leave much to be desired, and there are certain operations (e.g., on the bowel) in which this variety of infection is the chief danger. In obstetric work, on the other hand, no such striking transformation has occurred, for the reason that extrinsic infection, even in pre-Listerian days, was of far lesser frequency than intrinsic infection, and therefore an anti-sepsis, primarily intended to guard against the former manner of infection, and against it alone, has relatively failed.

INTRINSIC INFECTION.

Every human body harbours on or in it enough organisms of potential virulence to fatally infect a wound of that body, given that the initial organismal implantation be in sufficient numbers to overcome the resistance of the tissues in the area of implantation. In puerperal sepsis the attacking organism is usually a streptococcus, and the wound infected is the placental site, and as it is certain that the uterus before labour is, as a rule, sterile of organisms, the streptococci must, as a rule, infect the placental site during or after the labour. Bond showed that minute particles placed in the upper vagina found their way unassisted into the uterus and tubes, and this has been confirmed by Everard Williams and Russell Reynolds,[1] who also found that in animals at all events previous artificial closure of the abdominal ostia prevented the particles from ascending. He suggested that the agency of ascent was an aspirating action from the peritoneal cavity. It would appear almost certain, then, that during the early puerperium, when the uterine cavity is open to the vagina and so soon as the tubes have regained continuity with the uterine cavity,[2] organisms from the lower canal must frequently find their way upwards.

That streptococci are frequent inhabitants of the vagina in apparently normal pregnant women is not now in dispute. Lockhart,[3] whose very fine paper should be studied in this connexion, found them in 48 per cent. of the cases he investigated, and FitzGibbon and Bigger [4] in 68 per cent.

If this were all, the problem of puerperal infection would lie in explaining, not how infection of the placental site occurred, but why it occurred so seldom. It is, however, not all; research shows that the streptococci inhabiting the vagina before delivery are rarely hæmolytic, whilst those found in the uterus in puerperal sepsis most commonly are hæmolytic. Moreover, when hæmolytic streptococci are found in the vagina before labour they are very rarely of the variety *S. pyogenes*, which is the organism chiefly found in puerperal sepsis. That non-hæmolytic streptococci can occasion puerperal sepsis is,

[1] Brit. Med. Jour., April 11th, 1925.

[2] The question how soon after delivery communication between the tubes and the uterine cavity is effected after delivery needs answering if the ascent of particles from the vagina into the uterus is due to aspiration from the peritoneal cavity.

[3] Brit. Jour. of Obst. and Gyn., vol. xxxii., No. 1.

[4] Ibid., vol. xxxii., No. 2.

however, certain, for in a minor proportion of the cases they are the only organisms found in the uterus. Thus FitzGibbon and Bigger [4] found that, out of 47 septic cases from which they isolated streptococci, there were eight in which the organisms were non-hæmolytic, and of these four died. The capacity of non-hæmolytic streptococci to produce severe inflammation is, moreover, proved by the bacteriology of acute appendicitis. Dudgeon and Mitchiner,[5] from 27 cases isolated streptococci 19 times, and of these, in no less than 18 the organism was non-hæmolytic. The fact that, in puerperal sepsis, the bulk of the streptococci found are hæmolytic is regarded by some as proving the origin of the disease to be commonly extrinsic, but no such conclusion should be drawn, for it is to be remembered that as a differentiator between virulent (usually hæmolytic) and non-virulent (usually non-hæmolytic) streptococci the uterus is an infinitely more delicate selective culture medium than anything that has yet been produced in a laboratory. Given that of various streptococci gaining access to the placental site, only one in a thousand was virulent and hæmolytic, in 24 hours it would become the predominant organism, although in laboratory cultures taken before the septic proliferation had begun it would be undetectable, being overgrown by the much more numerous avirulent non-hæmolytic organisms. Lockhart's remarks in this connexion should be studied. Moreover, although the experimental transformation of non-hæmolytic into hæmolytic streptococci has only occasionally been successful in the laboratory, it is not certain that it does not occur in the septic puerperal uterus. On this matter Lockhart's observations are again very illuminating. Of 48 women from whose vaginæ streptococci were isolated before the labour, 18·7 per cent. developed pyrexia after the labour, although the organisms found before labour were hæmolytic in one case only; whilst of 52 women whose vaginæ did not contain streptococci before labour only 1·9 per cent. developed pyrexia after their labour. Hæmolytic streptococci were found in abundance in the vaginæ of four of the puerperal women from whom non-hæmolytics alone had been isolated before labour, their appearance coinciding with the onset of post-partum pyrexia. It can be argued that these had probably been introduced during or subsequent to the labour, but it is certainly possible that they derived from hæmolytics present in too small a number before labour to be detected, or were the result of the conversion of the non-hæmolytics then discovered.

Given, then, that the causative organism is resident in the woman before labour, it will be manifest that there are two manners of infection of the placental site, "autogenous" intrinsic infection and "conveyed" intrinsic infection.

AUTOGENOUS INTRINSIC INFECTION.

Intrinsic infection can only be called "autogenous" when the septic organisms attain the placental site unaided by manipulation or instrumentation. There are two possible ways in which they may do this: (1) Organisms resident in the upper vagina may ascend into the uterus during or subsequent to the labour. (2) They may be transplanted there by the blood-stream before, during, or after labour.

Spontaneous Organismal Ascent.—(1) That organisms in certain number do ascend into the uterus during the puerperium seems undoubted. That they do not commonly produce sepsis can be explained by the facts that (*a*) they are usually of low virulence, (*b*) that blood (the lochia) possesses bactericidal powers, and (*c*) that the tissues of the placental site are more or less resistant. Autogenous organismal ascent is best of all demonstrated by the much increased likelihood of sepsis which accompanies Cæsarean section when it is performed after the membranes have ruptured and the uterine cavity is in free communication with the vagina, even in cases in which there has been no intra-vaginal manipulation beforehand and in which vigorous methods have been taken to sterilise the vagina before opening the uterus. It must be admitted that, when sepsis follows Cæsarean section, it does not, as a rule, exhibit the typical clinical features of virulent "puerperal fever," but this is not surprising firstly because the chances are against very virulent organisms being present in the vagina, so that the infection would be, as a rule, of relatively low intensity, and secondly because the surgeon's wound in the uterus, with its many foreign-body sutures, probably offers far less resistance to organismal invasion than the placental site. It is certain that, in the majority of cases of Cæsarean section gone septic, the symptoms suggest that the main area of infection is the uterine and abdominal wounds and not the placental site, though I have seen typical "puerperal fever" follow the operation.

There are individuals who are habitually infected with streptococci, the organisms residing either in their nasal sinuses, gums, tonsils, urinary tract, or intestine, or in several of these sites coincidently. Certain of these persons may be described as suffering from generalised streptococcosis, and in them the body resistance to this organism is probably abnormally low. Any injury is likely to go hard with such an individual, birth injury included.

Streptococcal vaginitis of non-venereal origin is a condition very commonly met with, not only in married women of all ages, but also in virgins. The source of the infection is probably intestinal in most cases, and from many of these patients streptococci can be recovered from the urine as well, whilst in others it is obviously only one manifestation of a generalised streptococcosis. It is a most intractable type of infection, and may continue for years in spite of vigorous treatment, a fact which suggests that reinfection is continually occurring, as it would do if the primary source was in the intestinal tract and this remained untreated. If a woman with streptococcal vaginitis becomes pregnant the probability is that the organisms will ascend into the uterus after the labour, where they may or may not produce symptoms according as the resisting power of the placental site be high or low. In this connexion I will quote a case which exemplifies the views I am putting forward. The patient was a young woman whom I was called in to see on account of puerperal fever which had followed in two days a normal and entirely uninterfered-with labour, the child and placenta having been born before the doctor arrived. It was her third child, and I was informed that both her first and her second labours had been followed by high fever and signs of sepsis. On examining her I noticed that, although her teeth were perfect, her gums were purple and pulpy and showing marked recession. This condition was a sequela of scarlet fever at the age of 13, which had persisted in spite of every treatment except the removal of her teeth, to which she had resolutely objected. The attack of puerperal sepsis on this occasion proved fatal, and there can be no reasonable doubt that hers was a case in which extensive harbourage of virulent streptococci had existed for years, with consequent chronic infection of her intestinal tract and probably of her vaginal and urinary passages as well.

Blood Infection of the Placental Site.—That wounded tissue may become infected through the blood-stream is undoubted, and therefore the possibility of such happening to the placental site cannot be denied, especially in the case of a woman suffering from generalised streptococcosis. It must be remembered that the carriage of organisms by the blood appears to be a much commoner occurrence than was formerly believed to be the case; witness pyelitis in which the causative organisms almost certainly enter the kidney through the blood-stream. Nothing definite is known about blood-borne infection of the placental site and the subject has received little attention, but its occurrence would explain these occasional cases of puerperal sepsis in which the symptoms date from the very onset, or even precede, a perfectly normal and uninterfered-with labour. In a woman the subject of

[5] Brit. Jour. of Surg., vol. xi.

generalised streptococcosis the uterine wall before labour may conceivably contain streptococci.

Conveyed Intrinsic Infection.—Though intrinsic infection is undoubtedly at times autogenous, there are strong reasons for believing that, in the majority of cases, it is conveyed; that is to say, the septic organisms, though derived from the patient's own body, are transported into the upper vagina or the cavity of the uterus by the agency of hands or instruments. The source from which the organisms of conveyed intrinsic infection are most usually drawn is undoubtedly the bowel, whose organismal content is derived not merely from the stomach and intestine, but from the drainage of the nose, mouth, pharynx, and throat.

A consideration of the results which follow traumatic perforation of the gut or bruising or strangulation of its wall leaves one in no doubt that of the organisms present in the intestine many are potentially virulent, even in the most healthy person. Far from being easily tolerated by the tissues, they are, in fact, held within bounds by a fence of tissue resistance so delicate that the least injury to it is followed by an invasion more or less dangerous. Seeing the position of the vagina in relation to the rectum, the relative freedom from intestinal organisms of the former canal, when in perfect health and in the virgin state, is remarkable, though they are much more frequently found, especially towards its lower end, in the married and parous. The approaches to the vagina —viz., the vulva and the perivulval and perianal skin—are always heavily infected with organisms derived from the bowel, and it is a bacteriological impossibility to pass anything into the vagina without carrying up some organisms from the outside. The character of the organismal infection thus effected will depend on the character of the bacterial content of the fæces, and this varies in different individuals. In the majority of persons *B. coli* is predominant, while streptococci are sparse and chiefly of the "fæcalis" group, but sometimes this proportion is reversed, *S. fæcalis* being abundant and *B. coli* sparse. In other persons again, *S. viridans* or types allied to it are present in large numbers. This organism is of the type commonly found in the mouth. *S. pyogenes* is not commonly found in the bowel, but the technique for separating the various organisms present in a culture as mixed as the fæces is not yet perfect enough to always detect an organism present in small numbers. The fæcal organisms, as has been said, are derived not merely from the intestine but from the throat, nose, and mouth, and in infective states of these parts are passed down into the rectum. Pilot and Davis [6] and others have shown that hæmolytic streptococci are commonly present in the tonsil, while they are the organisms usually responsible for bronchitis and broncho-pneumonia. They are also present in pyorrhœa and in scarlet fever, though the variety in all these conditions differs in certain details from *S. pyogenes*. It is thus apparent that the infection of the vagina conveyed by the passage of something into it must be regarded in every case as potentially a virulent one.

The fact that *S. pyogenes*, the commonest organism of severe puerperal fever, is apparently rarely present in cultures of the fæces has been held to prove that in the majority of the grave cases (those exhibiting *S. pyogenes*) the infection was not derived from this source. Closer consideration of the matter, however, shows that on the contrary the fact cited fits in very well with the view that they *are* so conveyed. For if *S. pyogenes* was constant in the fæces, then most women during their confinements would have it introduced into their vaginæ in the process of vaginal examination and severe puerperal sepsis should be very common indeed. That it occurs a great deal too often is admitted, but with nothing like the frequency postulated by the assumption. The proportion of deaths by puerperal sepsis in England and Wales at the present day may be taken at about 1·3 per 1000 live births, and it may be accepted as certain that the great proportion of these women die of streptococcal infection. The proportion of cases of hæmolytic infection (*S. pyogenes*) to those of non-hæmolytic infection (*S. viridans*, *S. fæcalis*, &c.) in severe puerperal fever may be taken in general as somewhere about 3 to 1, or 75 per cent. (FitzGibbon and Bigger 70 per cent., Hauch 80 per cent.), and there is no reason to materially alter this estimate for the group of cases that die of the disease, for FitzGibbon's and Bigger's series show that the non-hæmolytic was at least as fatal as the hæmolytic infection. Thus we may roughly assume that one woman dies of *S. pyogenes* infection of her uterus for every 1000 labours. Now, the death-rate of cases of puerperal fever due to streptococcic infection (whether hæmolytic or non-hæmolytic) is roughly 40 per cent., that is to say, of every five women so affected two die and three recover,[7] and on this estimate there are five cases of puerperal fever due to *S. pyogenes* for every 2000 labours, or one for every 400 labours. If, then, we make the very modest assumption that the presence of *S. pyogenes* in the fæces would only be followed by infection of the uterus once in four times, then that organism would only be required to be present in the intestine of one parturient woman out of 100 such—i.e., with a rarity which fits in with the bacteriological findings.

That the infection has an intestinal source in many cases is strongly suggested by the frequency with which *B. coli* accompanies streptococci in the infected uterus. I and A. G. R. Foulerton, in our investigation into the causation of puerperal infections, published in 1905,[8] found this conjunction in 50 per cent. of all the cases from which we isolated streptococci from the uterus. At that time we explained the presence of *B. coli* as being due to a secondary infection, but subsequent consideration leads me to think that that view was probably wrong and that the colon bacillus gained entry to the uterus concurrently with the streptococcus.

PREVENTION IN VIEW OF CAUSATION.

The problem of how to prevent puerperal fever fundamentally depends on a true appreciation of the sources and mechanism of the infection. These may now be summarised in the following table, a study of which at once suggests the formidable difficulties we are up against.

Septic Infection of the Placental Site.

Source of infection.		Manner of infection.
1. *Extrinsic:* Organisms alien to the woman introduced during or after labour.		(1) Intra-uterine manipulation or instrumentation. (2) Intravaginal manipulation or instrumentation, plus spontaneous organismal ascent from the vagina.
2. *Intrinsic:* Organisms resident in or on the woman at the time of labour.	A.	(1) Blood infection. (2) Spontaneous organismal ascent from the vagina.
	C.	(1) Intra-uterine manipulation or instrumentation. (2) Intravaginal manipulation or instrumentation, plus spontaneous organismal ascent from the vagina.

A = Autogenous. C = Conveyed.

Prevention of Extrinsic Infection.—Considering first infection from an extrinsic source because the problem of its prevention is comparatively simple, we may, at the outset, rule out air infection, since it has been shown that aerial transport of septic organisms practically does not occur—a mercy indeed, for if dust was an active agency surgery would be impossible. There remain, then, the persons, instruments, and appliances of the attendants. Instruments and appliances can with certainty be rendered sterile, and, in fact, are so in practically every case nowadays. The hands of the attendants can also be rendered safe by wearing sterile rubber gloves, and this again is common practice. That instruments, appliances, and gloves initially sterile can act as conveyers of

[6] Amer. Jour. of Infective Diseases, April, 1919.

[7] The writer and A. G. R. Foulerton had 10 deaths in 25 and FitzGibbon and Bigger 20 in 47.

[8] Trans. Obst. Soc. of London, vol. xlvii.

infection into the vagina or uterus is, however, obvious, if subsequent to sterilisation they are brought in contact with an infected surface, but as regards infection from an extrinsic source, this could only happen as the result of great carelessness and one may add extraordinary ill luck, for the surfaces of the towels, sheets, tables, basins, and so forth, in an ordinary lying-in room, though not sterile, probably not once in many thousand times are contaminated with virulent streptococci.

There is, however, another source of extrinsic infection more difficult to shut out—namely, the throat, nose, and mouth of the attendant. That these regions are frequently the seat of potentially virulent streptococcic infection is undoubted. That such might be conveyed by the salivary spray of persons suffering from tonsillitis, sinusitis, or gingivitis must be admitted. This is recognised in surgical work, where no operation is performed without the operator and his assistants being masked. Obstetric operations differ in no essential from those of ordinary surgery, and logically the same precautions should be observed. Infection by salivary spray has been held by certain writers to be a ready explanation of the occurrence of puerperal sepsis. Whilst agreeing that it probably sometimes occurs, I am of opinion that it does so rarely, for having had a long experience both of the "pre-mask" and "mask" periods of surgery, I know that mask wearing has not made that difference to surgical results which it should have done if infection by salivary spray was at all common.

When, then, we review the possibilities of extrinsic infection, and the means that have been taken, and are taken to-day, against it, and consider the relatively poor results achieved, we have, I submit, no option but to believe that beyond this source of puerperal sepsis there is another which operates with much greater frequency, to the prevention of which I shall now turn.

Prevention of Intrinsic Infection.—Given that organisms potential for puerperal sepsis are already resident in or on a woman before labour, our countermoves against the menace to the placental site are clearly as follows: 1. To prevent or do away with all foci of septic harbourage before the labour, or if possible before the pregnancy. 2. If this is impossible, to take measures to prevent living septic organisms reaching the vagina. 3. And if this is impossible because the vagina is already infected, to take measures to prevent living septic organisms reaching the uterus; or if the uterus is already infected or has, of necessity, to be infected during the labour, to take steps immediately the labour is over to destroy the organisms present in the uterus. 4. To raise the resistance of the body tissues against all infection from wheresoever menaced.

The general plan of campaign, then, is simple, but it needs scarcely a moment's thought to realise that its accomplishment is confronted by many difficulties.

ABOLITION OF SEPTIC FOCI.

The final logical outcome of our argument is obviously that a woman should not conceive until it is certain she harbours no potential sepsis. This is a counsel of perfection which, in its fullest sense, will probably never be attained; for to begin with, no hard-and-fast line can be drawn as to what constitutes menaced sepsis; for instance, most of the organisms normally present in the intestine are potentially virulent. On the other hand, much can be done in this direction that has hitherto not been done or done imperfectly. The prevention or cure of such things as chronic tonsillitis, sinusitis, or gingivitis has a special desirability in the case of a woman likely to become, or presently to become, a mother, as have also attention to the teeth, general hygiene, and cleanliness. Conception obviously carries an increased risk in a woman suffering from vaginitis, and as far as a medical man may influence such a matter he should advise against pregnancy until the vaginitis is cured. A vaginitis complicated by pregnancy should be treated vigorously, though it must be owned that the difficulty of doing this successfully is great. Though at first it may appear fantastic, remorseless logic leads to the conclusion that the bacterial content of every pregnant woman's vagina should be ascertained from time to time, so that the obstetrician may take what precautions are possible in the event of organisms likely to produce sepsis being found there. The urine also should be examined for bacteria. And, still pursuing the logical sequence, it is plain that the bacterial content of the intestine should be investigated. Here we are at once up against the difficulty that the bacteria most plentiful in the fæces are, even in the most healthy person, potentially pathogenic. That there is considerable variation in the bacterial content of the intestine I have already pointed out, and, other things being equal, it would appear that the woman in whose fæces streptococci predominate stands in greater risk of puerperal sepsis than the one in whose fæces the colon bacillus is in major quantity. We are, however, only at the beginning of understanding as regards these matters, and our laboratory methods for separating, classifying, and estimating the pathogenic possibilities and probabilities of the intestinal bacteria leave much to be desired. I visualise, however, a time when our knowledge will be so much more precise that the bacteriologist will be able to warn the obstetrician that this or that particular patient carries in her intestine organisms which menace in an abnormal degree the safety of her delivery.

SAFEGUARDING OF THE VAGINA.

The abolition of all septic harbourage, especially in the near neighbourhood and the approaches of the vagina, is at present impossible, and hence the next obvious item in our campaign against puerperal sepsis is to prevent septic organisms reaching the vagina. This is impossible in those cases in which the vagina already contains streptococci, but these are in the minority, for the bacterial content of that canal, when perfectly normal, is an innocuous one. I have already pointed out that it is a practical impossibility to pass anything into the vagina without transplanting into it some of the organisms resident on its approaches, and these approaches are always more or less fouled by intestinal bacteria and sometimes by organisms derived from the urine. Nothing, therefore, should be passed into the vagina that can be avoided, not only during labour but for some time beforehand. Blair Bell has published evidence which suggests that coitus during the last few weeks of pregnancy may convey into the vagina organisms which, later, produce puerperal sepsis. In view of what we know, this seems quite possible, especially if the male organ is in an infective state from balanitis, cowperitis, urethritis, or prostatitis, but beyond this intestinal organisms are certain to be carried up in the act and some of these may be actively pathogenic.

The fingers and instruments of the obstetrician are a still more likely agent of conveyed intrinsic infection. Gloves can be worn and instruments boiled, but as conveyers of organisms from the vaginal approaches they are just as efficient as the bare hand and the forceps taken out of the hip pocket. Once again we are up against a difficulty, for fingers and instruments must be used in obstetric surgery. In certain regions of the body, as for instance the abdomen, the surgeon can guard against the conveyance of organisms from the skin by covering the edges of his wound with towels or sheet rubber, but the vaginal orifice through which the obstetric surgeon has to work does not lend itself to this. We can, however, endeavour to sterilise the perianal and perivulval skin by the application of a strong, non-irritating antiseptic, and this being done sterile towels should be affixed so as to cut out of the operative field the most infected part of the danger area—i.e., the anus and perianal skin. Even with such precautions the risk of conveyance is not entirely done away with, for organisms may lie inside our protective barrage. This possibility can be coped with by anointing the finger, hand, or instrument with some powerful but non-irritant antiseptic before

it is passed into the vagina, so that if any organisms are carried up in the process they get a lethal dose in transit. For this purpose I use "violet green," the antiseptic introduced by Carl Browning and myself some ten years ago.

SAFEGUARDING THE UTERUS.

But there are cases in which the vagina is already infected with streptococci by the time labour begins, and these women stand in peculiar jeopardy from spontaneous organismal ascent during the puerperium and from direct manual or instrumental conveyance of the organisms into the uterus during the labour. When a woman is known to be suffering from vaginitis, the practitioner will be on the alert against these dangers, but unfortunately the presence of virulent organisms is not always announced by visible signs of inflammation. It is safest, therefore, to regard every vagina in labour as though it was septic and to avoid as far as possible the passage of anything through it into the uterus. If such passage has to be made, then the vagina should be thoroughly swabbed out beforehand with a strong non-irritant antiseptic, and the hand or instrument, before it is passed up, should be anointed with the same. Where infection of the placental site is specially to be feared, as, for instance, when the patient has an obvious vaginitis, the further precaution should be taken of either swabbing out or douching out the uterine cavity at the conclusion of the intra-uterine manœuvres. I need scarcely remind you in this connexion that manual removal of the placenta or any intra-uterine manipulation after the placenta is delivered is far more dangerous than turning the child or rotating the head within the amniotic sac, since the membranes protect the uterine wall from infection. It might be thought that during the puerperium spontaneous organismal ascent could be prevented, or at all events rendered harmless, by antiseptics applied to the vagina, and so it could be if we had a sufficiently powerful yet innocuous antiseptic at our disposal, and means of easily introducing it into the vagina so that the whole surface of the canal was flooded with it. In practice, however, this is well-nigh impossible, and the attempt carries with it the risk of conveying organisms from the vulva and its approaches. Douching in the puerperium has, therefore, been largely given up of recent years, though there are occasions on which it is the right thing to do if it can be done thoroughly.

There are certain cases of profound vaginal infection in which the best course is to discard that passage as the route of childbirth and perform Cæsarean section before labour has begun. This avoids the possibility of the obstetrician having to directly infect the uterine cavity in the course of intra-uterine manipulations forced on him by the exigencies of the labour, but it does not, of course, entirely abrogate spontaneous organismal ascent during the puerperium. As an example, where the choice lies between Cæsarean section and induction of labour, and the vagina is known to be infected, the abdominal operation is the one to be chosen. Finally, there remain those very grave cases in which the uterus is apparently infected before labour and fever is present from its start or even before it starts. I believe that in some of these the best chance would be given the woman by performing hysterectomy directly the child was delivered.

RAISING RESISTANCE.

Finally, as it is certain that our best endeavours to hunt out and kill the organism, or even to prevent it reaching the uterus, are, in the present state of our knowledge, liable to fail, the question of whether it is possible to raise a pregnant woman's resistance to streptococcal infection merits very serious thought and research. It is no new idea, as you know, and vaccines and serums have been tried quite extensively but up to now with no definite results. That it should be possible to do it with certainty seems reasonable, and that it will be possible in the future I have no doubt. Even as matters stand to-day I think you will agree with me that in a case where streptococcal infection is specially to be feared, prophylactic doses of antistreptococcic serum should be administered.

NECESSITY FOR IMPROVED CONDITIONS.

The scheme of prevention that I have outlined makes great demands on the medical man, and it is impossible for him to comply with them unless he is granted the requisite means, material, and environment. I have before protested against the inadequate circumstances under which much midwifery in this country is carried out and will not repeat myself beyond reiterating my conviction that no great diminution of puerperal morbidity and mortality can be expected until the public is prepared to pay for the things that are necessary for safety in childbirth.

I have ventured to liken the measures required to abolish puerperal sepsis to the moves of a campaign, and, I would add, a very arduous one at that, because the enemy we contend against is rarely in the open but wages a guerrilla warfare by ambush from unexpected quarters. The struggle has been going on indeterminately for more than 50 years, and as far as I can see will so continue until the man in the front line, the doctor in charge, can fight on a more advantageous *terrain*, with more reliable weapons and methods to his hand and better and more readily available help behind the line.

THE TREATMENT OF ACUTE BACTERIAL INFECTIONS

WITH INTRAVENOUS INJECTIONS OF PERCHLORIDE OF MERCURY AND MERCUROCHROME.

BY LEONARD S. DUDGEON, C.M.G., C.B.E., F.R.C.P. LOND.,

PROFESSOR OF PATHOLOGY, UNIVERSITY OF LONDON; DIRECTOR OF PATHOLOGY, ST. THOMAS'S HOSPITAL.

THE treatment of acute bacterial infections by intravenous injections of perchloride of mercury and mercurochrome 220 is recorded in this communication. The fact that we are without specific treatment for many of the acute bacterial infections has resulted in the trial of various chemical preparations of recent years. I have devoted considerable time to many of these preparations and, therefore, it appeared to me that some advantage might occur if my observations with perchloride of mercury and mercurochrome 220 were put on record. Experience has led me to recognise very fully the necessity to commence such treatment at the earliest possible period from the onset of the illness, just as is now generally recognised to be the essential feature in the treatment of diphtheria and tetanus with the appropriate antisera. In my opinion valuable time is frequently lost in the desire to prove that an infection is generalised as judged by the cultivation of bacteria from the blood. This is especially the case with septic infections complicating obstetrical operations and those due to *S. aureus*.

The *Staphylococcus aureus* by no means infrequently produces an acute inflammatory process of the skin and subcutaneous tissues which may resemble an anthrax pustule. The intensity of the local lesion may not be sufficiently realised, but a fulminating general toxæmia may develop so that death occurs in a few days from the onset of the illness. It is remarkable how rapidly some of these acute bacterial infections advance, as if the patient's resistance were entirely in abeyance, and it is still more serious when we consider that these patients were more often young adults and apparently in perfect health before the illness commenced. It is difficult to believe that satisfactory treatment will be evolved to combat these acute septic infections unless such treatment is carried out at the *earliest possible moment*. I have treated 330 cases of acute bacterial infections with perchloride of mercury or mercurochrome 220 soluble, or with both these preparations, and in the vast

majority of cases the actual treatment has been carried out in detail by me.

Personal experience at the outset in the intravenous administration of therapeutic preparations is desirable. Unfortunately in 25 instances out of these 330 cases the patients were moribund when I was asked to commence treatment, and nothing short of a miracle was likely to have been of the slightest effect towards favouring the patients' chances of recovery. In most of these cases no active treatment had been employed during the acute and brief illness, but in some of the streptococcal infections small doses of antistreptococcal sera had been administered. In all 47 deaths occurred, including six cases of malignant endocarditis, which entirely failed to respond to treatment with either or both of these preparations. This is not surprising when we consider the pathological changes found at autopsy in malignant endocarditis, and that in my experience the disease is usually far advanced by the time the diagnosis is arrived at.

It is a legitimate argument to adopt that some of the patients treated by the intravenous inoculation of perchloride of mercury or mercurochrome 220 soluble, would have recovered without this line of treatment, but this question cannot be definitely settled, although there is very little doubt that it is correct. In the early periods of these acute infective processes it is not possible to form an accurate judgment of the chances of a patient's recovery, and we have no information to guide us as to the length of time which is safe for the infection to remain untreated. It is desirable, therefore, to commence treatment in the early stages of the illness, even if a certain proportion of patients are inoculated with perchloride, mercurochrome 220, or other remedy who might have recovered otherwise.

Perchloride of Mercury.

The first case of septicæmia which I treated with perchloride of mercury occurred in 1918 in the Balkans.

The patient, a soldier, was suffering from an acute illness which was diagnosed on clinical evidence as malignant malaria. There were no physical signs except enlargement of the spleen and pyrexia, but, as he had been for two years in the Balkans, the infection was regarded as malarial in origin. This acute illness, however, was unaffected by quinine. A complete bacteriological examination of the blood and urine was made when the patient's temperature was 105° F. I then gave him 1/16 grain (gr.) of perchloride of mercury in 10 c.cm. of normal saline, intravenously, which was repeated about 12 hours later as no improvement had occurred. After the second injection the temperature fell rapidly from 105° to 100° and then to normal, and the patient made a complete and rapid recovery. The only ill effects were a sharp attack of diarrhœa and mercurial stomatitis, both of which responded to treatment. No malarial parasites were found, but a hæmolytic streptococcus was cultivated from the blood.

It was not until after the war that I employed this method of treating acute bacterial infections on a relatively large scale. The dose given to the patient referred to above was considered at the time to be the maximum advisable and was dissolved in 10 c.cm. of saline, so as to reduce the possibility of local thrombosis to a minimum, but the various essential points at present adopted in this method of treatment will be referred to subsequently.

I have now treated 200 cases of acute bacterial infections with perchloride of mercury; these cases, which were in no sense selected, included puerperal fever, *Staphylococcus aureus* infections (including severe cases of boils and carbuncles), infections due to hæmolytic and non-hæmolytic streptococci, *Bacillus coli* infections, and other septic processes. Twenty-seven cases of puerperal fever were treated and 22 recovered. From three of the cases which recovered hæmolytic streptococci were cultivated from the blood, from two cases non-hæmolytic streptococci. From the remainder blood cultures were sterile or were not made, but from all the fatal cases streptococci were isolated from the blood. Hæmolytic streptococci were obtained from the region of the cervix in every case.

Baccelli [1] many years ago employed intravenous injections of mercuric chloride for the treatment of syphilis, and in 1907 he recommended this treatment for gonorrhœal rheumatism. There is very little reference in the literature to the perchloride treatment of acute bacterial infections, but in 1918 it appears to have been used in various parts of the world. Vecki,[2] of San Francisco, employed a solution of 1 in 1000 for intravenous injections and gave 3·5 c.cm. (which is nearly one-sixteenth of a grain) and repeated the dose when necessary, while in chronic cases he repeated the injections on several occasions. In his cases, which included furunculosis, carbuncles, acute adenitis, erysipelas, and other septic processes, the early fall in the temperature was a striking feature, while the general result was most satisfactory. Ferrari[3] claimed good results from daily doses of 0·01 gramme (g.) of mercuric chloride in influenza, which amounts to approximately 3·0 times my average dose. Pérez, of Madrid, quoted by Vecki, reported a most pronounced curative action from intravenous injections of mercuric chloride in puerperal septicæmia in doses of 10 c.cm. of a solution of 1 in 1000 (0·01 g.). Mello,[4] of Rome, injected 2·5 mg. of mercuric chloride intravenously twice during a period of 24 hours, then 4 mg. (1/16 gr.) at the same interval, for two consecutive days in three cases of puerperal fever which terminated in complete recovery. Nixon,[5] of Texas, states in reference to this method of treatment: "It has been revived from time to time, and each time abandoned, because obliteration of the veins has been produced." To avoid this complication he recommended that the patient's blood should be allowed to mix with the solution of mercury in the syringe, and then the mixture of blood and mercury injected. In his opinion, by this means the ill-effects of the perchloride were avoided, as shown by the results which he obtained in 50 cases without a mishap.

I am indebted to Captain D. C. Monro, R.A.M.C., surgical specialist at the Royal Herbert Hospital, for particulars of a case of septicæmia which he treated along the lines advocated by me with intravenous perchloride of mercury.

The patient, a gunner, aged 22, was admitted to hospital for a strangulated inguinal hernia; two days after operation he had broncho-pneumonia, and his condition was so bad that antistreptococcic serum was given and repeated to the extent of 120 c.cm. in 24 hours, without benefit. A bacillus of the influenza type was isolated from the blood stream. Two injections of perchloride of mercury were given intravenously within 48 hours, with very considerable benefit in the degree of toxæmia and with rapid fall of temperature terminating in complete recovery.

Technique.

The method which I employ is to give 5 c.cm. of a 1 in 1250 solution of perchloride of mercury (1/16 gr.) in saline as a first dose and repeat the injection, if necessary, in 12 to 24 hours, according to the patient's condition. My maximum dose for one injection so far has been 7 c.cm. of 1 in 1250, and such dosage has been reserved for cases which did not appear to offer much hope of success at the outset of treatment, but in two of these cases, although recovery ensued, obstinate mercurial stomatitis developed. In my experience, if four injections given over a period of three days fail to produce definite improvement it is useless to continue with this line of treatment.

The perchloride solution is always freshly prepared and is injected directly into a vein which is rendered prominent for the moment. A little blood is allowed to flow into the syringe and mix with the mercurial solution and the mixture is then injected into the lumen of a vein.

Complications.

Thrombosis.—In one instance only local thrombosis occurred as a result of the injection of perchloride of mercury. This patient was unconscious at the time of the first injection and was suffering from *Staphylococcus aureus* pyæmia. I have found that the dilutions of perchloride of mercury in saline which I have recommended are perfectly satisfactory and can be safely employed, provided none of the solution is injected until the blood flows freely into the syringe. The escape of perchloride into the wall of the vein or

surrounding tissues will lead to thrombosis which may have serious consequences. Such cases have been recorded in the literature; in fact, the perchloride treatment has been abandoned by some because of thrombosis, tissue necrosis, and other ill-effects owing to faulty technique or from excessive dosage. If, however, every possible care is exercised during the intravenous inoculation of perchloride of mercury, the local risk is negligible. If thrombosis due to the infection has occurred before treatment is commenced, it *may* increase as a result of the mercurial injections, although I have risked this complication.

Diarrhœa.—This may be severe and occur within an hour or two of the intravenous injections. At the outset it may be beneficial, but early treatment must be adopted unless it is of a mild character. There may be as many as eight or ten motions in the same number of hours. In my experience, although the severe form of diarrhœa is very exhausting to the patient at the time, it appears ultimately to be of distinct advantage. The most efficient method of treating this complication is by means of salines with opium.

Stomatitis.—Twenty hours, or even less, after the intravenous injection of perchloride the gums may be painful, spongy, and red, and show a tendency to bleed. Small ulcers may form which are sometimes very intractable to treatment.

Nephritis.—The most dangerous complication is usually considered to be nephritis, but in spite of the large number of injections which I have given nephritis has not occurred. The urine should be examined before and during treatment. In those cases where there has been a large amount of albumin and casts, the perchloride treatment has not been attempted. Two cases of septicæmia were treated with mercuric chloride who had marked albuminuria, but the renal efficiency in each instance was regarded as satisfactory, and no ill-effects followed. Guillain and Gardin, in 1922,[6] reported a case of acute nephritis with cardiac failure from the intravenous injection of perchloride of mercury, and it is stated that mercury was present in the cerebro-spinal fluid.

Reactions, General and Local.

The effects of the intravenous injections may be described as general and local. A slight rise of temperature may occur shortly after the injection of perchloride, and the patient, unless precautions are taken, may suffer from shiverings or true rigors; the temperature may then show a definite fall and may approach or reach the normal level within 24–48 hours, or further injections may be necessary. In some cases, although the progress of the disease appeared to be arrested, recovery was a very slow process. In many instances the fall of temperature was very striking and a marked diminution in the degree of toxæmia occurred which was readily recognised by the patient. When perchloride of mercury is injected intravenously in the early stages of an acute infective process there is a strong chance that improvement will occur, but as the duration of the acute illness lengthens, so the chance of improvement from perchloride diminishes. The chief local change has been arrest of the extension of the inflammatory process, more especially in spreading inflammation involving the face and neck, but when no general beneficial action of the perchloride occurs, there is no probability of arrest of the local process.

In one case of this kind the beneficial effects of the perchloride were very remarkable.

The patient, a man of 60, had a very extensive acute inflammatory process with considerable necrosis involving the upper and lower lip and neck due to the *Staphylococcus aureus*, and he was very toxic. Surgical opinion was opposed to surgical treatment. A diminution in the degree of toxæmia rapidly followed the intravenous injection of perchloride of mercury and the local spread of infection was arrested. A second injection was given of 1/12 gr., and resolution of the inflammatory process occurred.

In cases with closed abscess formation, perchloride of mercury intravenously is useless.

It is believed that this treatment is dangerous, because it is stated that the perchloride greatly depresses the activities of the polymorph, which, of course, is a serious objection. When the late Prof. S. G. Shattock and I were studying the variation in the phagocytic action of the polymorph in the blood in various acute and chronic infective processes, we found that in spite of a depressed phagocytic action of the cells in the blood, and a total reduction in their numbers, yet complete recovery from an acute infective process was possible. In some of the cases treated with perchloride of mercury the total number of polymorphs was reduced and their phagocytic activities depressed, subsequent to the injection of the perchloride, yet the infection was aborted and complete recovery ensued. A detailed record of the blood reactions following intravenous inoculations of perchloride of mercury and mercurochrome 220 will, however, be fully dealt with at a later date.

Mercurochrome 220.

In 1919 Young, White, and Swartz[7] introduced a new preparation for the treatment of bacterial infections. Chemically it is the di-sodium salt of dibromoxymercury fluorescin. It is readily soluble in water and normal saline and is unaffected by moderate heat or exposure to air. It contains about 26 per cent. of mercury, and even 1 per cent. of this preparation does not form a precipitate with hydrocele fluid. The wide range of application of the drug in urinary and many other septic processes is fully recognised, but it is only the intravenous use of this preparation which is now under consideration.

Toxicity.—Young, White, and Swartz found from their experiments that 10 mg. per kilo invariably killed rabbits in 24 hours, while 5 mg. produced an albuminuria which lasted one week. Dogs tolerated 10 mg. quite well, but albuminuria occurred without rise in blood urea. It has been shown that alkaloids and certain local anæsthetics may be precipitated by mercurochrome 220. Kolz, quoted by Warren,[8] has recorded a case of poisoning owing to this incompatibility with procain.

Personal Experience: Mercurochrome 220.

I have used this preparation intravenously in 150 cases of acute bacterial infections subsequently to, or instead of, perchloride of mercury, and have found it to be of definite value. Mercurochrome 220 dissolved in saline hæmolyses red blood corpuscles, but in the presence of blood serum or blood plasma the hæmolytic activity is considerably reduced. With washed red cells hæmolysis occurs with a dilution of 1 in 2000 in saline in vitro, while I employ for intravenous inoculations strengths of 1 in 200, 500, and 750 in saline without ill-effect.

I have given daily intravenous injections of mercurochrome for five days without observing any complications which could be credited to it, and possibly daily injections could be given over a longer period. The dramatic effect recorded on several occasions after one or two injections of perchloride of mercury, when the acute infective process was suddenly aborted, has never resulted from injections of mercurochrome. A shivering or true rigor which may follow an intravenous injection of mercurochrome 220, but especially perchloride of mercury, can be prevented, or greatly modified, by keeping patients warm during and after treatment and by giving about 10 gr. of aspirin with hot tea immediately after the inoculation.

In the report issued by the Medical Department of the United Fruit Company,[9] Dr. Deekes and his colleagues record their results with mercurochrome 220 soluble, administered intravenously. A 1 per cent. solution was employed almost entirely, and the dosage varied from 10–15 c.cm., which was repeated as required, but "with few exceptions (such as in patients almost moribund) there was a severe reaction in the form of chills, fever, vomiting, diarrhœa, and stomatitis. These untoward symptoms were usually

of brief duration and differed considerably according to a variety of conditions." Various infections were treated and the results appear to have been satisfactory. Twenty-six cases of lobar pneumonia were inoculated intravenously with mercurochrome, with a mortality of less than 20 per cent., while in the same medical division the mortality from lobar pneumonia over a period of years was 49·13 per cent.

It will be noticed, however, that severe reactions complicated with stomatitis followed these inoculations. In my opinion these toxic symptoms can be explained by the strength of mercurochrome 220 employed for the injections. From personal experience 10 c.cm. of 1 in 200 of this preparation in saline is the maximum dose which should be given, and when the injections have to be repeated it is necessary to reduce the strength of the solution to 1 in 500 after two or three doses of 1 in 200 have been employed. Cases of nephritis with blood, albumin, and casts in the urine have followed injections of mercurochrome 220 in doses of 1 in 100.

The essential fact in the treatment of acute bacterial infections is the neutralisation of the bacterial action without damage of the tissues, but there is a tendency at the present day to concentrate on parasitic destruction without sufficient regard for the host. Some of the disasters which have followed the inoculation of so-called therapeutic remedies have been due to this cause. If acute nephritis is produced there is every possibility that other important structures may be similarly affected, although proof positive evidence may not be obtained during the life of the patient.

The cases treated by me with mercurochrome were similar to those treated with perchloride of mercury, although the fulminating and very severe cases mostly received perchloride of mercury at the outset, and were subsequently treated with mercurochrome 220 when necessary. This preparation can be given, as already stated, in repeated doses provided the correct dilution is employed. Sudden arrest of the inflammatory process did not occur with mercurochrome 220, but in a few instances the acute infective process was sufficiently improved that one or two intravenous injections were sufficient. In most cases four or five injections were necessary. In about 20 per cent. of the cases treated with mercurochrome, which were very largely of a less severe type than those treated with perchloride of mercury, no benefit occurred.

References.

1. Baccelli (1907): La via delle vene apperta si Medicam Eroici, Rome.
2. Vecki, Victor G. (1919): The Use of Intravenous Injections of Mercuric Chloride in the Treatment of Suppurating and Infectious Diseases, Jour. Amer. Med. Assoc., May 31st.
3. Ferrari (1918): Riforma Med., Nov. 9th.
4. Mello, S. (1919): Policlinico, Rome, Oct. 26th, xxvi., No. 43.
5. Nixon, P. I. (1916): The Intravenous Use of Mercuric Chloride, Jour. Amer. Med. Assoc., May 20th, vi., p. 1622.
6. Guillain, I., and Gardin, C. (1922): Mercuric Chloride Poisoning, Annales de Médecine, Paris, April 11th, No. 4.
7. Young, H. K., White, E. C., and Swartz, E. O. (1919): The New Germicide for Use in the Genito-Urinary Tract, Mercurochrome 220, Jour. Amer. Med. Assoc., lxxiii., 20, Nov. 15th.
8. Warren, L. E.: Incompatibility of Mercurochrome 220, Soluble, with Local Anæsthetics and Alkaloids, Jour. Amer. Med. Assoc., lxxx., 15, April 14th, 1923.
9. United Fruit Company, Medical Department, Thirteenth Annual Report, 1924, pp. 83–95.

BRADFORD HOSPITALS.—As we recently announced, a new building for the Bradford Royal Infirmary is to be built at an estimated cost of £500,000. The scheme, which was initiated in 1909, provides for about 400 beds with the necessary adjuncts and all the most modern appliances, and will include a block of separate rooms for paying patients. There are at present 215 beds. The infirmary has been four times enlarged during the last 60 years—it has recently celebrated its centenary—but nearly 30 years have elapsed since the last expansion. The Bradford Corporation Mental Deficiency Committee propose erecting, at a cost of £179,000, a new institution to hold 700 patients. The North Riding County Council will take 100, and York Corporation and Huddersfield Corporation 50 beds.

DETERMINATION OF THE BASAL METABOLIC RATE.

BY T. C. HUNT, B.A. OXF.,
OF THE SURGICAL UNIT, ST. MARY'S HOSPITAL, W.

THE standard method used almost universally in England for the estimation of the basal metabolic rate is by the Douglas bag and gas analysis. Although admittedly an accurate, and for physiological purposes an extremely valuable method, it suffers clinically from the drawback that it is a tedious and somewhat laborious estimation, and its technique requires considerable experience if error is to be avoided. For these reasons any simpler, easier, and more rapid method for routine clinical use, and one, moreover, that is capable of general employment in ordinary practice, without the necessity of laboratory aid, is clearly of the greatest value. Such an apparatus is that devised by Sanborn, the "Handy Metabolor,"[1] and this short investigation has been undertaken to see how far accuracy need be sacrificed in order to gain the advantages of speed and simplicity.

For this purpose parallel determinations have been made of the basal metabolic rate in a number of cases in the wards of St. Mary's Hospital both by the Sanborn and the Douglas bag methods, to decide how much trust may be placed in the results of the former as compared with those of the latter. For many reasons the exactly correct basal metabolic rate is an exceedingly difficult value to obtain, though clinically an error of 10 per cent. is not of great significance. With the Douglas bag method a really careful worker can obtain more accurate results than this, and therefore the values obtained by this method in the cases examined were taken as the true metabolic rates with which the Sanborn results might be compared.

Procedure: the Douglas Bag Method.

In all cases the procedure was the same; the usual precautions were taken to exclude mental excitement, movement, &c., and all patients were in bed in the post-absorptive state. The "physiological" method was first employed, and an interval of 15–30 minutes was allowed before beginning the "clinical" determination, to avoid subjective psychic effects resulting from the first investigation. The determination by the Douglas bag method was carried out in the ordinary way, in most cases two samples at least of expired air being analysed in the Haldane gas analysis apparatus. It was found during the few preliminary investigations that a commonly unsuspected source of error could be traced to delay between filling the bag and taking out the samples for analysis (and measurement of the total volume). Although, of course, it was realised that such an interval must, if prolonged, lead to escape or alteration of the gas contents of the bag, it was at first thought—and many workers are constantly in the habit of doing this—that a full bag could with safety be left from, say, noon until evening before a sample for analysis need be taken out. A few determinations from an absolutely new full bag at hourly intervals showed that in even so short an interval a definite diffusion of carbon dioxide outwards occurred, so that regularly diminishing CO_2 values were obtained. This is a question of the solubility of the gas in the rubber lining of the bag, and occurs only very slowly (and negligibly) with oxygen. (This solution and diffusion may be strikingly seen if hydrogen is used in the bag.) This error is, of course, easily eliminated by taking a sample of gas from the bag as soon as it is filled into an evacuated sample tube, after which the analysis is carried out when convenient. The oxygen intake, CO_2 output, respiratory quotient, and hence the basal metabolic rate were determined, using Zuntz's tables of the calorie value of one litre of oxygen and Du Bois height-weight formula for the calculation of the surface area.

[1] Basal Metabolism. By F. B. Sanborn, 1048, Commonwealth-avenue, Boston, Mass., U.S.A. 1922.

The Sanborn Method.

With the Sanborn method, taking, of course, the same care as to preparation, &c., the patient simply breathes in and out of a spirometer which is filled with oxygen and contains a soda-lime cylinder which absorbs carbon dioxide. The actual technique of the method is fully explained in Dr. Sanborn's book, "Basal Metabolism," and it is sufficient to say that the apparatus is portable, and that with very little experience both the actual determination of oxygen consumption and the calculation from this of the basal metabolic rate may readily be completed within 20 minutes. The inherent error in the method is that pure oxygen with no CO_2 is an abnormal substance to breathe (and in time becomes definitely toxic), and that the respiratory quotient is impossible to calculate and has to be taken as a constant for all individuals at an average figure of ·82. There is further a technical error, in that observations of oxygen consumption are not capable of being read to less than 25 c.cm., and that corrections for temperature and pressure are only approximately made. The first is not a very serious objection. It is found that if three-minute spells of oxygen breathing are observed, the first is higher than the second—up to 25 per cent.—the second still perhaps 10 per cent. higher than the third, but that further observations are then found to remain remarkably constant within the limits of the technique. This is clearly due to the simple solution of oxygen in the blood from the increased pressure of the gas in the lungs and, though leading to an initial apparent increased oxygen consumption, saturation soon occurs and no further solution takes place. Unequal ventilation of the lungs and previous undersaturation of the hæmoglobin of the blood will also lead to false high values, but these factors will normally cause but little or no error. (The alveolar CO_2 tension cannot, of course, be calculated in Sanborn's method, and though this is lowered in pure oxygen breathing, especially if any hyperpnœa from nervous influences exists (Hill and Flack), it is doubtful if over a short period the actual oxygen consumption is at all markedly altered from that occurring when ordinary air is breathed.)

As to the constancy of the respiratory quotient—a factor, of course, essential for the calculation of the basal metabolic rate—it at first appears to be a most serious objection that differences in this value, if they exist, cannot be determined. In my series the respiratory quotient varied from 0·78 to 0·91, though 69 per cent. had actual values between 0·80 and 0·84; it is certain that the Sanborn figure of 0·82 cannot be taken as the exact value for all individuals, but it is remarkable how little difference in the actual basal metabolic rate results from a fairly large variation in the respiratory quotient. As an example of this, an oxygen consumption of 220 c.cm. per minute gave by Sanborn's calculation with respiratory quotient 0·82, a basal metabolic rate of +33, but with the actual respiratory quotient as found in the Douglas bag method of 0·76, +31. Thus with a comparatively large change in respiratory quotient, an almost negligible error is introduced into the actual calorie output per square metre per hour. With regard to the actual observation error, the mean value of oxygen consumption per minute is obtained with very fair accuracy (∓5 per cent.) by taking the values of four three-minute spells of breathing; and neglecting a short preliminary period of one or two minutes.

The Two Methods Compared.

The results in a series of 25 cases showed a surprisingly close agreement between the two methods. Cases were taken both of those suffering from thyroid deficiency or hypersecretion and of others regarded as normals who were in the wards for various other conditions. Of seven cases showing clinically no evidence of metabolic disorders, six agreed by both methods within 10 per cent. as having normal basal metabolic rates. The closeness of this agreement may be seen from a typical example.

Patient A. A., aged 53; weight 170 lb., height 73 in. Pulse 76, resp. 20. Suffering from slight prostatic enlargement.

Sanborn:

Corrected volume of oxygen consumed per minute (mean of four three-minute spells)	= 263 c.cm.
Normal for patient	= 260 c.cm.
Basal metabolic rate	= Normal.

Douglas Bag:

O_2 consumed per min. at STP	= 257 c.cm.
R.Q. = 0·83 (1 litre O_2 = 4·84 cals.)	
Surface area	= 2·1 sq. metres.
Cals. per hr. (15,420 c.cm. oxygen)	= 74·6.
Cals. per hr. per sq. m. surface area	= 35·5.
Normal for patient	= 38 cals.
Basal metabolic rate	= −5.

Of these six normal values, five had a Sanborn value above that of the Douglas bag value, though within 10 per cent. of the latter. Of the other two cases giving normal Douglas bag values, one was 8 per cent. lower and one 17 per cent. lower as found by Sanborn's method. Of 15 cases with clinical evidence of hyperthyroidism, the basal metabolic rate by the Douglas bag method varied between +11 and +108: in nine of these the Sanborn gave values above those of the Douglas bag within 15 per cent.; three gave values within 10 per cent., lower than the Douglas bag: and three gave values one 28 per cent., one 34 per cent., and one 50 per cent. above the Douglas bag values. In three cases when the Douglas bag value was below normal (one of frank myxœdema) the Sanborn gave in two, values higher by 9 per cent. and 21 per cent., and one lower by 4 per cent. Thus of 25 cases, four only, or 16 per cent., varied more than 15 per cent. from the Douglas bag result. Of the remaining 21, 15, or 75 per cent., gave values between 0 per cent. and 15 per cent. higher than the "true" value—average 11 per cent. Twenty cases of the total 25 were within 12 per cent. of the Douglas bag value (5 below, 15 above), or 80 per cent., and of these 75 per cent. were values too high.

Thus, though these results were obtained over a small series of cases, the conclusion may be drawn that the Sanborn method is accurate within clinical demands—∓12 per cent.—in 80 per cent. of cases, and that the error, if any, is in 75 per cent. of cases, one of too high and not too low a value.

I should like to express my thanks to Prof. C. A. Pannett, of the Surgical Unit, St. Mary's Hospital, at whose suggestion this paper was undertaken, for the help he has given me throughout the investigation.

BLOOD TRANSFUSION.

A PLEA FOR THE DEFIBRINATION METHOD.*

BY ROBERT PLATT, M.D. SHEFF., M.R.C.P. LOND.,
MEDICAL REGISTRAR, ROYAL INFIRMARY, SHEFFIELD.

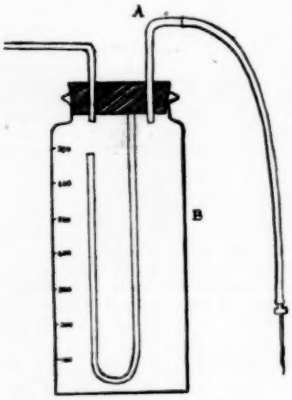
THE two great hindrances to the progress of blood transfusion in the past have been: (1) reactions following the introduction of incompatible blood; (2) the rapid coagulation of blood removed from the vessels. The first difficulty was solved by Jansky [1] and Moss [2] with the discovery of the blood-groups. Many attempts have been made to solve the second, the most convenient solution being the use of citrated blood, first introduced in 1914.[3] The last 11 years, however, have taught us that there is now another difficulty—namely, the "citrate reaction." The symptoms which commonly follow the introduction of citrated blood are a rise in temperature, rigors, and a feeling of general malaise, often accompanied by headache. They occur in at least 20 to 40 per cent.[4] of citrate transfusions—some observers say 60 per cent.[5] or even 70 per cent.[6] The reactions are not due to agglutination or hæmolysis, and hæmoglobinuria never occurs.

The early advocates of the citrate method made light of the symptoms, and rightly so, for by popularising blood transfusion, as a therapeutic method, there is no doubt that many lives have been saved. On the

* A paper read before the Chirurgical Club at their Sheffield meeting, Oct. 1st, 1925.

other hand, the symptoms of the reactions are always disturbing, sometimes definitely prejudicial to the recovery of the patient, and have been known to be fatal.[4] That the reactions are due to the citrate and not to the many other factors which have been suggested is shown by the fact that such reactions practically never occur when whole blood is used—and as I hope to show later, when defibrinated blood is used; by the case recorded by Keynes,[7] in which the donor himself, having received some citrate developed a reaction; and by the experiments of Drinker and Brittingham,[8] who showed that citrated red cells, thoroughly washed, might be toxic even to the individual from whom they were taken.

FIG. 1.



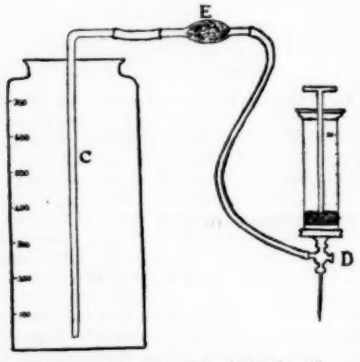
Apparatus arranged for collecting and defibrinating the blood.

My plea is that the final problem of blood transfusion has now been solved by the introduction of a method if anything more simple than the citrate method, and practically free from reactions. I refer to the use of defibrinated blood. This was first employed as long ago as 1835,[9] but we owe to Colebrook and Storer, who published their paper in 1923,[10] the introduction of the present simple technique. My own method is merely a modification of theirs, in most essentials identical, but I think slightly more simple. However, since defibrinated blood is still but rarely used, the method will be briefly described.

Technique.

1. *Collecting the Blood.*—A wide-bore needle, connected to about 12 inches of rubber tubing, is inserted into the donor's vein. The tube leads through the glass connexion (A) into the jar (B) (Fig. 1). A glass rod, bent in the shape of a U, protrudes from the under surface of the rubber bung, and must all but touch the bottom of the jar. The blood is allowed to flow into the jar by gravity, and as soon as the first few c.cm. are collected, an assistant shakes the jar briskly in such a way as to keep the blood rotating round the U-shaped rod. This rotation is kept up the whole time that the blood is being collected, and for *at least six minutes afterwards.* All the fibrin collects on the rod, the rest of the blood remaining permanently fluid. Instead of the usual tourniquet on the donor's arm, a blood-pressure armlet pumped up to about 80 mm. of mercury ensures that the veins, but not the arteries, are obstructed. A suction bulb may, if desired, be attached to the second tube leading into the jar. This tube is otherwise only necessary as an air outlet.

FIG. 2.

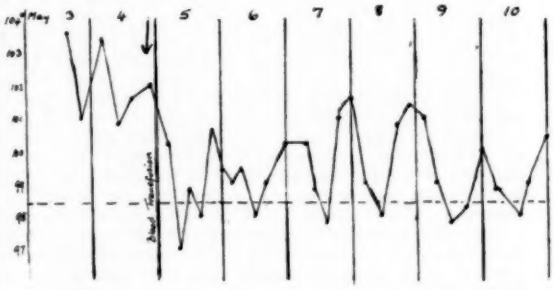


Apparatus arranged for injecting the blood.

2. *Injecting the Blood.*—The rubber bung and its attached tubes are removed from the jar, and with them the U-rod and adherent fibrin. The long glass tube (C) (Fig. 2) is then inserted into the jar. This is connected by a rubber tube to the two-way tap (D), but the rubber is interrupted by a small glass bulb (E) which contains *glass*-wool to act as a filter for possible small clots. The tap (D) is connected with a syringe at one end, and with a needle or cannula at the other. Before inserting the needle or cannula, the whole system is, of course, filled with blood by suction from the syringe. The blood from the jar is then injected in successive syringefuls, the tap being turned alternately to fill from the jar, or empty into the vein. In the majority of cases it is easier in the long run to dissect the vein of the recipient under local anæsthesia, and use the cannula. The syringe, tap, needles, and cannulæ all have "Record" mounts, and are interchangeable. With the exception of these parts, the whole apparatus can be made in any laboratory, but the Medical Supply Association can supply the whole apparatus, or any part of it.

Colebrook and Storer brought out their method for the purpose of giving immunised blood. They claim that by immuno-transfusion many cases of septicæmia are benefited, the temperature actually falling after transfusion. I have never tried immuno-transfusion, but I have had several results which I think are as striking as theirs. The chart shown in Fig. 3 is from a case of septicæmia and secondary hæmorrhage from a septic wound of the leg; 200 c.cm. of the patient's blood were removed by venesection, and replaced by 500 c.cm. of defibrinated blood. He made a very good recovery. In 34 consecutive transfusions

FIG. 3.



Temperature chart before and after transfusion.

I have not had a single symptom of a reaction, nor a rise of temperature in a previously afebrile patient. Colebrook and Storer, in a later paper,[11] record a similar freedom from reactions, again referring to immuno-transfusion.

In the course of the series, I have given most of the combinations of blood-groups that are compatible—namely, IV. to IV.; IV. to III.; IV. to II.; IV. to I.; III. to III.; II. to II.; and II. to I. The cases include several of pernicious anæmia transfused more than once. In septicæmia, pyæmia, bacterial endocarditis, and other febrile states there is usually a fall of temperature and clinical improvement, which, however, in severe cases is only too often temporary.

Conclusions.

1. The disadvantage of transfusion with citrated blood is the frequency with which "reactions," often mild, sometimes serious or even fatal, follow the introduction of the blood. 2. In 34 consecutive cases transfused with defibrinated blood no such reaction occurred. 3. The defibrination method is, if anything, the simpler of the two. 4. The defibrination method therefore deserves much greater popularity than it has yet received. If, after extended trial, it still proves satisfactory, the citrate method should be abandoned as obsolete.

References.

1. Jansky, J.: Klinicky Sborink, 1907, viii., 85.
2. Moss, W. L.: Johns Hopkins Hosp. Bull., 1910, xxi., 63.
3. Agote, L.: Anales del Inst. Modelo de Clin. Med., Buenos Ayres, January, 1915.
4. Bernheim, B. M.: Jour. Amer. Med. Assoc., 1921, lxxvii., 275.

5. Unger, L. J.: Ibid., 1917, lxix., 2159.
6. Personal communication to the author.
7. Keynes, G.: Blood Transfusion, London, 1922, p. 122.
8. Drinker, C. R., and Brittingham, H. H.: Arch. Int. Med., 1919, xxiii., 133.
9. Bischoff, T. L. W.: Arch. f. Anat. Physiol. u. Wissensch. Med., 1835, 347.
10. Colebrook, L., and Storer, E. J.: THE LANCET, 1923, ii., 1341 and 1394.
11. Same authors: Brit. Jour. Exp. Path., 1924, v., 47.

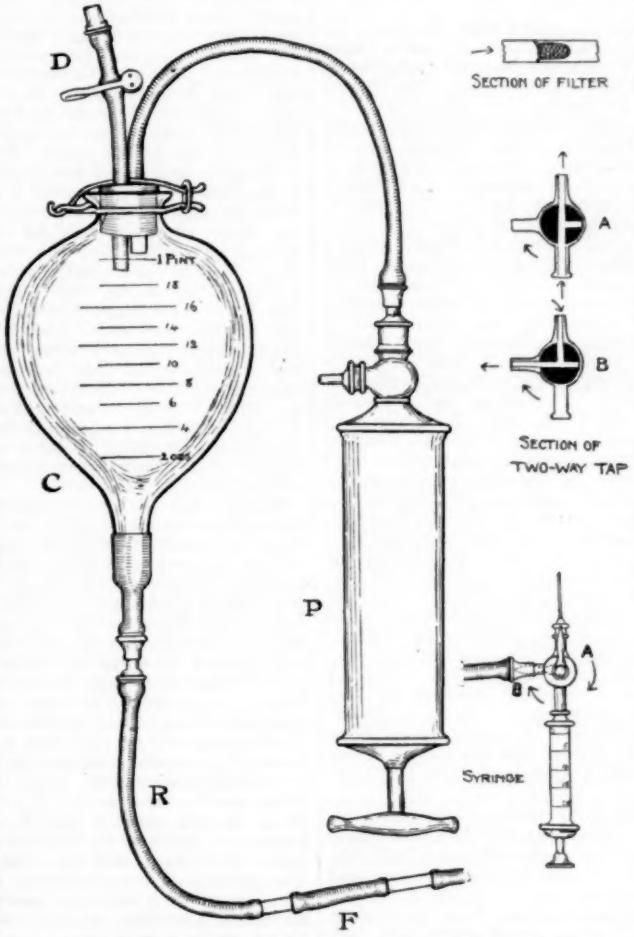
A BLOOD TRANSFUSION APPARATUS.

INTRODUCING THE USE OF "RECORD" SYRINGE NEEDLES BOTH FOR THE DONOR AND THE RECIPIENT.

BY H. H. MOLL, M.D., M.R.C.P. LOND.,
MEDICAL TUTOR AND REGISTRAR, UNIVERSITY OF LEEDS.

THE following apparatus has been devised for transfusing citrated blood with "Record" syringe needles. The method briefly consists of aspirating the blood from the donor's vein into a glass container and of pumping it into the recipient's vein through a fine needle.

The transfusion bottle is shown in the accompanying diagram, and consists of a pear-shaped glass container, closed at one end by a rubber stopper fitted with an air-inlet tube (P) and a shorter tube (D) which collects the blood from the donor. After having collected the blood, a long tube (R) is attached to the lower end of the container and conveys the blood to the recipient. It is provided with a filter consisting of a thimble of fine wire gauze inserted inside the tube between two glass connexions. The apparatus is also provided with a powerful suction and pressure pump and with a two-way stop-cock; the former is attached to the air-inlet tube, the latter to tube (D) or (R), and is fitted with a needle and a syringe. By means of this stop-cock the operator may first ensure that the needle is inside the vein by drawing off a little blood into the syringe, and then by a quick turn of the tap divert the flow of blood into the container, or into the recipient's vein, as the case may be. This eliminates unnecessary delay in connecting the apparatus to the needle after the vein has been punctured and prevents blood clotting inside the needle. A thick and short (1 in. long) exploring needle is used for collecting the blood from the donor, whilst a very fine needle (such as is used for intravenous injections of galyl) is used for transfusing the blood into the recipient's vein.



The blood transfusion apparatus is shown ready for transfusing blood into the recipient. P, Suction and pressure pump connected with container, C. D, Inlet tube from donor (clipped). F, Filter. R, Outlet tube to recipient (the two-way stop-cock, syringe, and needle have been attached to the distal end).

Technique.

The required amount of a freshly prepared 5 per cent. solution of sodium citrate is aspirated into the container. The mixture of citrated blood should not contain less than 0·5 per cent. sodium citrate (i.e., for a pint of blood 2 oz. of a 5 per cent. solution are required). The two-way stop-cock, fitted with the syringe and needle, is attached to the inlet tube (D) with the tap turned in such a way as to have the needle and syringe communicating. Having punctured the vein of the donor, the operator withdraws some blood into the syringe (thus ensuring that the needle is inside the vein) and then turns the tap and allows the blood to flow into the container. The flow of blood is assisted by means of the aspirating pump and by instructing the donor to clasp and unclasp his fist alternately. Only a very slight negative pressure is required, as too much suction is liable to collapse the walls of the vein. A tourniquet should have been placed around the upper arm of the donor, tight enough to obstruct the venous blood, but sufficiently loose to allow the radial pulse to be still felt. After having withdrawn the required amount of blood, tube (D) is clipped, tube (R) is attached to the lower end of the container, and a little blood is allowed to be run through in order to expel all the air contained therein.

The procedure of transfusing the blood into the recipient's vein is similar to the one described above when collecting the blood from the donor, but the tourniquet has to be unloosened as soon as the vein is punctured. A fair amount of pressure is required in order to maintain a steady flow of blood through the very fine needle.

This method of blood transfusion is easily carried out at the bedside and does not require any local anæsthetic. The same vein may be used repeatedly when blood transfusions are required at frequent intervals, such as in the treatment of pernicious anæmia.

Mr. Charles F. Thackray, Great George-street, Leeds, is the maker of the blood transfusion apparatus.

ERYTHRŒDEMA OR PINK DISEASE.*

BY C. P. LAPAGE, M.D. MANCH., F.R.C.P. LOND.,

LECTURER, DISEASES OF CHILDREN, UNIVERSITY OF MANCHESTER; PHYSICIAN, ROYAL MANCHESTER CHILDREN'S HOSPITAL, PENDLEBURY; PHYSICIAN FOR CHILDREN, ST. MARY'S HOSPITALS, MANCHESTER.

THE condition about to be described has lately made its appearance in Great Britain, and occurs in young children. It has been called erythrœdema, erythrœdema polyneuritis, acrodynia, and pink disease. The characteristics are fairly sudden onset in a healthy baby, beginning with irritability, insomnia, and loss of appetite. A miliary rash appears, followed by the development of the characteristic pinkness of the hands, feet, and face, and marked hypotonia of the muscles. Symptoms resembling meningismus appear, and the child becomes intensely miserable with photophobia, gingivitis, and dropping out of the teeth. Death may occur very suddenly as the result of weakness or terminal infection, or the child may make a slow recovery and return to complete health.

History.

Early in 1921 Wood[1] described this disease. He mentioned that Swift, of Adelaide, had read a paper in 1914 at the Tenth Australian Medical Congress at Auckland, founded on notes of 14 cases. The disease has, therefore, been recognised in Australia for a long time. More recently there have been many articles in America describing this disease, chiefly under the heading acrodynia. A good summary is given by Rodda,[2] in which he mentions that Bilderback in 1919 reported ten cases. In THE LANCET[3] in 1918 a summary of Swift's article is given. This was followed by a note on similar cases by Doak. Doak's cases are not fully described, but some may have been pink disease, though three of them gave a positive Wassermann. They occurred in the Infants Hospital, Bradford. Swift stated that he had seen cases of the disease when he was in London, and Parkes Weber demonstrated a case which was probably one of severe erythrœdema in 1921, and described it as pink disease in 1922. Thursfield and Paterson described a case in 1921–22, and Paterson and Greenfield gave a complete account of the disease[4] in a report of post-mortem examinations on two fatal cases. They use the name erythrœdema polyneuritis because there was distinct evidence of polyneuritis in the autopsies in their two cases. Fowler's article also gives a detailed account of the disease with reports of four cases. In other parts of Europe not much attention has yet been given to the disease, though it has occurred. Comby in France reported a case in 1922, and Feer and Keller in Germany. In Manchester cases have been met with for some three years. The first case which I recognised as pink disease was seen by me in May, 1923, and in June, 1925, I showed some cases at a clinical meeting of this society. From my own experience I have no doubt that a considerable number of cases have been occurring in and around Manchester for the past two or three years, and in many instances have not been recognised.

Detailed Description.

A baby from 1 to 3 years old, who has previously been well, becomes from no apparent cause irritable, loses appetite, sleeps badly, and begins to whine and cry. Marked perspiration and a miliary (sweat) rash develop, and the infant becomes steadily weaker. Then, often quite suddenly, his hands and feet become red and swollen, and take on the characteristic pink appearance. The rash continues to appear, sometimes with small pustules, and in most cases desquamation occurs, noticeably at the edges of the pink areas. The pink appearance may spread to the cheeks and nose, and that in the hands and feet usually assumes a deeper and blue colour. In the later and recovery stages of the disease rather remarkable variations of this phenomenon occur; thus for some days the extremities will be merely a light pink and for others they will be cold and blue and have the appearance of a very large chilblain. The child is generally distressed because the hands and feet prick and burn, and he may try to alleviate this by rubbing or even biting the affected parts. Symptoms of head irritation may now appear, giving rise to a suspicion of meningitis, but they go no further than the signs described as those of meningismus. There is no real retraction of the head, but there is much irritation, because the child moves the head from side to side, and often pulls out the hair until he has bald patches.

Photophobia may be a very marked symptom causing the child to bury his face to avoid the light, thus adding to the picture of cerebral irritation and abject misery presented by the case. This appearance is further increased by the hypotonia of the muscles, as a result of which the child lies in a characteristic position of inertia, or sits up in a position of atonia with drooping shoulders, gaping of the mouth, and drooping of the eyelids. There is wasting with muscular weakness and paresis, the knee-jerks are diminished, and in some cases sensation may be impaired. But it is difficult to test for this because the child is so young. The hair becomes dry and wispy. Salivation occurs, and perhaps nasopharyngitis. Gingivitis may make its appearance, and go on to dropping out of the teeth. This is sometimes rather a striking feature of the case, and I have known it to be taken as evidence of a possible specific origin. It is usually a very troublesome complication, and the cause of much anxiety to parents and medical attendant. Ulcers of the mouth are not rare. If other special examinations are made the pulse is found to be rapid, the blood pressure very high, 100–120. The blood shows, according to Brown, a polymorpho-nucleosis, and, according to Fowler, a leucocytosis. Wassermann tests have been negative; the cerebro-spinal fluid has been negative, except in one case where Blackford reported an increase of globulin. The urine may show pus, but pyelitis may be the common complication of any such asthenic condition in a child. Several of my cases in the later stages when they were recovering had a curious golden-orange tinted urine.

We call the disease erythrœdema, but the œdema is not always very marked to external examination; there is, however, no doubt that it does occur. Thus Butler reports a section of the skin to show the intense hyperkeratosis and much œdema. The pinky-blue appearance of the extremities remains a very marked feature of the case throughout the long course of recovery; it comes and goes, the variations not always seeming to be related to chilly atmospheric conditions but more to some nervous control. This is suggestive, in view of the theory that the sympathetic nervous system is affected.

The progress of the case is, in my experience of 12 cases, usually favourable, but there are quite a number of fatal results. If the case is going to improve, there is after one or two months a gradual improvement in the general health. The child begins to take more interest in his surroundings, sleeps better, takes more food, and the symptoms begin to abate. The period of convalescence is long, and may last for one or two years, but recovery is complete. Not all cases, however, proceed to a favourable termination; quite a number of cases have been reported as dying suddenly with no apparent cause, others die by a terminal infection, or by the process of gradual exhaustion. There is no definite evidence yet as to the reason for sudden death.

Ætiology.

Age: In most cases this disease occurs in young children between 1–3 years. Rodda reports a case at the age of 7 years. Sex: Both sexes are equally

* A paper read before the Manchester Medical Society.

[1] Medical Journal of Australia, February, 1921.
[2] American Journal of Diseases of Children, August, 1925.
[3] THE LANCET, 1918, i., 611.
[4] Quart. Journal of Medicine, 1923–24.

affected. Season: Most cases occur in the early spring or summer, and it has been suggested that the disease follows outbreaks of influenza of the spring before. Distribution: There is as yet no evidence of cases coming from any one area. My cases came from widely separated areas though most of them were from south Manchester. The history of the disease seems to show that it occurred first in Australia, then in America, and then in Europe. It certainly seems to be a new disease here. I can remember during the last 20 odd years occasional cases of a very similar nature which we then called meningismus, but I have no notes or recollections of having seen the characteristic pink appearance of the extremities. If the disease is not new it has certainly increased very much in this district in the last three years.

There are several theories as to causation; one of the most likely is that it is an infective disease. Many observers report nasopharyngitis; some have found diphtheroid bacilli. Hess reported a case with ulcer of the pharynx leading up to mediastinal abscess as evidence of relation between the disease and local sepsis. Vipond reports two cases with adenopathy in which he isolated a Gram-positive diplococcus from the glands and administered a vaccine with good results in both cases. Paterson and Greenfield report a definite polyneuritis, affecting particularly the peripheral parts of the nerve trunks, with diffuse increase of small cells in the grey matter of the central nervous system, especially of the lumbo-sacral enlargement of the cord. There were also grave changes in the motor nerve cells of the ventral horns, particularly those supplying the distal portions of the limbs. But they state that they have no clear evidence of microbial invasion, though they think it likely. Blackford reports an autopsy in which evidence of encephalitis was found.

The rash is very like a septic condition, and I have made many attempts to obtain an organism from the pustule, but it is very difficult to find any actual pus, and I have only twice succeeded in obtaining a staphylococcus which was probably a skin infection. Several observers report cultural examinations of the blood, but up to the present they have been negative. Other observers report a very great improvement from removal of the tonsils and from intranasal treatment. Others, again, report very good results from artificial sunlight treatment which is most efficacious in septic conditions. Another possible theory is that it is a deficiency disease, and investigations have been carried out to see if diet had any effect, but most observers have come to the conclusion that the disease is not a deficiency one. Three of my cases were breast-fed at the time of onset. The trouble in the hands and feet very closely resembles that of a chilblain, and, in fact, many of the symptoms of the trouble might, as suggested by Feer, refer to disorders of the vegetative nervous system. These are salivation, rapid pulse, insomnia, mental depression, and the characteristic pinkness and œdema.

Nomenclature.

It is necessary to decide what name we shall give to this disease. At present there are the following to choose from—erythrœdema (Swift), (Wood), acrodynia (American), pink disease, erythrœdema polyneuritis (Paterson and Greenfield). The child certainly suffers from pinkness and usually from œdema, though this is not always very evident externally. I think that erythrœdema is a better name than acrodynia. Acrodynia means painful extremities, but it has already been used to describe an epidemic of acute infective polyneuritis which occurred amongst French soldiers, and it is a pity to transfer it to this disease. Many observers in America have adopted this term, but Butler and Bilderback do not agree with it. We have not yet sufficient evidence to say that polyneuritis occurs in all cases, and therefore it is doubtful whether we should add the word polyneuritis.

The name pink disease is an arresting description, and I think it is likely to hold. It is certainly useful in attracting attention to the disease to make it more fully recognised. We can therefore call the disease erythrœdema or pink disease.

Clinical Reports.

The following is a brief summary of notable points in 12 cases of pink disease which have recently occurred in my practice.

The first case was seen in May, 1923, the next four in 1924, two in June, one in July, one in September, and the next seven in 1925. March, April, May, two in June, July, and September. These dates refer to the onset of the disease. The disease, therefore, seems to occur in the late spring and early summer. The ages of onset were, three under the age of 1 year, all being breast-fed babies, and the rest under the age of 3 years; eight were boys and four girls.

With regard to the district in which the disease arose, seven were in the south side of Manchester, but were in widely scattered areas, as follows: Rostherne, Altrincham, Ashton-on-Mersey, Stretford, Rusholme, Chorlton, and Didsbury. There were cases also from Patricroft, Irlam o' the Heights, Bolton, and Hyde.

With regard to symptoms and signs, in two cases the bowels were loose and slimy at onset. All of the children had a decided rash, in only three was œdema a marked sign. In three of the cases there was a history of pulling out of the hair. Five of them had marked photophobia, and in one Dr. H. V. White, of the Eye Hospital, reported phlyctenular conjunctivitis and keratitis. In three cases there was history of nasal discharge, but in others there was no nasal discharge. Neuritic pains were present in one case. Ulceration of the gums was present in three cases. In two the teeth fell out, and in one there was a definite mouth ulcer inside the lower lip. One case developed intussusception in the course of the disease. It should be noticed that one of Paterson and Greenfield's cases died of intussusception. In at least eight cases there were decided signs of meningeal irritation. Chest signs in the form of bronchitis were present in two cases. The temperature was raised early on in the disease to 100° or 101° F. in four cases. The urine showed pyelitis in one case and in one marked deposit of urates, and in three in the later stages there was the definite golden colour. This sign is very noticeable when it is present. Blood culture (Dr. A. Sellers) was negative in one case. Swabs of pustules showed staphylococci in two cases, but these were regarded as skin infections.

With regard to treatment, open air, good hygiene, and generous diet were most effective; artificial sunlight did good in one case, and in all cases gastro-intestinal disinfection seemed to have effect. Tuberculin injections were given in five cases; in some cases they appeared to have a decidedly beneficial effect. All the 12 cases have made a good recovery.

Differential Diagnosis and Treatment.

The disease may be mistaken for (1) toxic œdema following gastro-enteritis, (2) meningitis, (3) multiple neuritis, (4) mental defect, (5) general tuberculosis, (6) congenital syphilis, (7) Raynaud's disease, (8) erythromelalgia, (9) rheumatism with sweat rash, and (10) pellagra. But in none of these is there the characteristic persistent pinkness of the extremities. Congenital syphilis gives the mouth signs and a rash, but not the pink extremities. The œdema of toxic œdema is much more pronounced and generalised. Once the disease has been noted it is easily recognised again.

Many observers in discussing the treatment deplore the fact that little can be done, but every effort should be made to relieve symptoms and promote recovery. Treatment should be directed to keeping up the strength, to relieving symptoms, and to trying to find some specific curative agent. Rest under good hygienic conditions is very important. The child must not be chilled too much, but, as the disease usually occurs in the summer time, open-air treatment can often be carried out. I have found this to help cases very much, especially if sunshine is available. With due attention to the bowels and digestion a generous diet should be given, especially during the misery stage. The nurse should attempt to persuade the child to take food. Tonics like cod-liver oil emulsion and nux vomica can be used. Paterson and Greenfield recommend small doses of arsenic. Thyroid does not do good.

The skin symptoms are chiefly those of the rash and irritability. Sweet recommends a dusting powder,

with oxide of zinc, starch, and boric acid, together with silk clothing; Field a daily bran bath. I have used an ointment of sulphur and carbolic ointment equal parts mixed. Wood recommends painting of the fingers and toes with tr. iodi.

Another possible means of relief is calcium lactate internally, on lines similar to the treatment of chilblains. The gums may be very sore, and in my first case, before I recognised the disease, I had ordered grey powder in fairly large doses owing to the possibility of specific origin. The medical attendant and I had a discussion as to whether the stomatitis was a mercurial one or a specific one. However, we persisted in the grey powder, and, I think, it had a beneficial effect. Cleanliness and soothing applications are useful. Fowler recommends painting the gums with 1 per cent. chromic acid. The acute misery and hypotonia are a very troublesome complication, especially as they are usually coupled with insomnia. Only general measures will have much effect on this. I have not found that meningeal signs are relieved by lumbar puncture in these cases. The insomnia is best treated by open-air and artificial sunlight or real sunshine, by alleviating irritation, and by soporifics such as antipyrin, dial, and bromides, but it is not easy to make much impression on it in the worst stages of the disease.

The nasopharynx should be cleared if there is any evidence of infection; Rodda claims that removal of the tonsils should be carried out in every case, and that it has a remarkable effect in shortening the duration of the disease. If the bowels are at all upset a gastro-intestinal disinfectant should be used. The photophobia is curious and it was this that led me to try tuberculin. Having had several cases of photophobia which have improved very much with tuberculin, I tried it in one of these cases before I knew what the disease was. It was tried in five cases and it did good in four of them. It is not suggested that the disease is tuberculous in origin, but it is suggested that tuberculin has an effect in shortening duration in some cases. The urine must be examined for pyelitis and suitable treatment adopted.

Sweet claims very good results from artificial sunlight. I have tried this in some of my later cases, but have not noticed the very rapid cure which he claims for it; still it is likely to be a remedy of value. It is important to warm the limbs before the exposure.

Specific Treatment.—Attempts can be made to obtain an infective agent from nasal secretions or pustules, or from the blood. But pustules are scarce and most of my cases had no nasal discharge. Vipond took cultures of material aspirated from affected glands in two cases and had a vaccine prepared with very beneficial results in each case.

The bibliography of the disease has already attained considerable proportions, as can be seen from the following references, some of which are quoted from the lists given by others.

References.

Bilderback, J. B.: J. Amer. Med. Assoc., 1925, lxxxiv., 495–498; Northwest. Med., 1920, xix., 263. Bliss, G. L.: Arch. Pediat. N.Y., 1923, xl., 707–714. Bogert, Van der: Arch. Pediat. N.Y., 1923, xl., 410. Brown, A., Courtney, A. M., MacLachlan, I. F.: Arch Pediat. N.Y., 1921, xxxviii., 609–628. Butler, J.: Arch. Dermat. and Syph., 1925, xi., 166. Bradford, J. R., and Alt: Quart. J. Med., 1918–19, xii., 89. Byfield, A. H.: Amer. J. Dis. Child., 1920, xx., 347. Cartin, H. J.: Pennsylvania M. J., 1921, xxiv., 287. Comby, J.: Arch. de med. d. enf., Paris, 1922, xxv., 680–685. Davis, C. M.: Arch. Pediat. N.Y., 1922, xxxix., 611–617. Doak, J. S.: THE LANCET, 1918, i., 684. Emerson, P. W.: J. Amer. Med. Assoc., 1921, lxxvii., 285. Feer: Ergebnisse. d. inner. Med. u. Kinderheilk., B. xxiv., S. 100, Berlin, 1923. Field, M. S.: Arch. Pediat. N.Y., 1922, xxxix., 116–121. Fowler: Edin. Med. J., 1925, xxxii., 177. Frank, E. S.: Nederl. Tijdsch. v. Geneesk., April, 1925, 1819–1822. Foerster, H. R.: Archiv. Dermat. Syph., 1925, xii., 17. Giffen, S. D.: J. Mich. Med. Soc., 1924, xxiii., 8–15. Helmholtz, H. F.: Amer. J. Dis. Child., 1925, xxx., 596. Hess, J. H.: Ibid., p. 597. Keller, W.: Klin. Wchnschr., 1925, iv., 1256; Amer. J. Dis. Child., 1925, xxx., 573. Lindsay, L. M.: Can. Med. Assoc. J., xii., 618 (Paterson and Greenfield). Littlejohn, E. S.: Med. J. Aust., 1923, i., 689–692. McKenzie, A. F.: Can. Med. Assoc. J., 1923, xiii., 43–47. McNeal, M. D.: Minnesota Med., 1922, v., 153–156. Miller, M. K.: Indiana Med. Assoc. J., 1921, xiv., 144. Paterson, D., and Greenfield, J. G.: Quart. J. Med., 1923–24, xvii., 6. Porter, L.: Med. Clin. N. Amer. Phila., 1922, vi., 431–444. Petren, K.: Rev. neurol. Par., 1921, xxvii., 812–814. Rodda, F. C.: Amer. J. Dis. Child., August, 1925, xxx., 2, 224. Rodda, F. C., and Butler, J.: Amer. J. Dis. Child., 1925, xxix., 288. Rewalt, R. K.: Atlantic. Med. J., 1924–25, xxviii., 127–130. Sweet, G. B.: Arch. Pediat., 1925, xlii., 543. Swift, D. H.: THE LANCET, 1918, i., 611. Szwajkart, A. L.: Arch. Pediat. N.Y., 1924, xli., 791–793. Thursfield, H., and Paterson, D.: Brit. J. Dis. Child., 1922, xix., 27. Thursfield, H.: Proc. Roy. Soc. Med., 1921–22, xv., Sect. Stud. Dis. Child., pp. 27–29. Thursfield, H., and Paterson, D.: Ibid., Proc. Roy. Soc. Med., p. 53. Weber, Parkes: Brit. J. Dis. Child., March, 1922, p. 17; Brit. Jour. Derm. and Syph., 1921, xxxiii., 228. Weston, W.: In Abt's Pediatrics, 1923, ii., 986–993. Weston, W.: Arch. Pediat., 1920, xxxvii., 513. Whitfield, A.: Proc. Roy. Soc. Med., 1922–23, xv[1]., Sect. Dermat., 75. Wood, E. J.: Amer. J. Trop. Med. Balt., 1921, 291–310. Wood, A. J.: Med. J. Aust., 1921, i., 145. Vipond, A. E.: Arch. Pediat. N.Y., 1922, xxxix., 699–704. Zahorsky, J.: Med. Clin. N. Amer. Phila., 1922, vi., 97–105. J. Amer. Med. Assoc., 1922, lxxix., 1925; J. Missouri Med. Assoc., 1922, xix., 296; Ibid., 296–300.

Clinical and Laboratory Notes.

A CASE OF ANEURYSM OF A SINUS OF VALSALVA BURSTING EXTERNALLY.

BY J. H. SHELDON, M.D., M.R.C.P. LOND.,
HON. PHYSICIAN, WOLVERHAMPTON AND STAFFORDSHIRE HOSPITAL.

WHILE it is common enough for an aneurysm of the arch of the aorta to rupture externally, this accident is an exceedingly rare termination in the case of an aneurysm originating from the sinuses of Valsalva, the commonest rupture in this case being into the pericardium. Intrapericardial rupture was prevented in the case now described by the presence of a coexistent adherent pericardium, probably of rheumatic origin.

The patient, a man of 49, acquired syphilis in 1895 when in India. He received mercurial treatment, and had no other illness till the end of 1914. He was then serving in the army in France and he had an illness diagnosed as rheumatic fever, and was in hospital for three months. This left him with a "slight murmur," and his sheet was marked "D.A.H." He was discharged in 1919 with a pension on account of V.D.H. Since then he had worked almost without interruption as a packer in a motor-cycle factory.

Two years ago, while watching a football match, he suddenly felt "a stiffness across the front of his chest," which developed into a pain that prevented him from walking home. It soon passed off, and he was able to work for a year, complaining only of occasional attacks of pain on the top of the right shoulder and on the front of the right chest. In July, 1924, a swelling appeared in the region of the right nipple and below. It was moderately painful and for the first time he was obliged to cease work. He resumed work again after five weeks in bed, the swelling being still present. In December, 1924, a soft pulsating swelling—quite separate from the first swelling—appeared in the mid-line of the sternum at the level of the sixth costal cartilage. This was diagnosed as a gumma, and he was sent to the V.D. department. W.R. was positive. Dr. G. Mitchell, in charge of the V.D. department, noted that the pulsating swelling over the sternum—of the size of a thrush's egg—was surrounded by a triangular area of skin over the lower half of the sternum, which showed well-marked syphilitic mottling. He was treated with iodides and injections of Luetol, and improved so much that by the sixth injection the swelling had entirely disappeared, though pulsation could still be seen and felt where it had been. He left off treatment, but three months later, in May, 1925, the swelling reappeared, and on May 25th the skin over it broke, a mass of pulsating blood-clot appearing. He was then transferred to me and admitted to hospital. During all this time since July, 1924, he had continued at work without interruption, suffering no pain and feeling no discomfort.

Condition on Admission.—On the right side of the chest there was a firm rounded swelling, with very slight pulsation, involving the third, fourth, and fifth costal cartilages, extending from the nipple line to the border of the sternum. The lower half of the sternum was covered by a triangular area of discoloured skin, and in this, opposite the ends of the sixth costal cartilages, was a round hold half an inch in diameter, filled by a mass of pulsating blood-clot, from which there was slight oozing of blood. The heart was enlarged, the apex beat and the cardiac dullness on the left reaching to the nipple line in the sixth interspace. The upper

limit of cardiac dullness was normal. On the right the limits of dullness were normal over the first two spaces, but below them the cardiac dullness was continuous with that produced by the rounded tumour. There was, therefore, continuous dullness from nipple to nipple. Heart sounds: double aortic murmurs, conducted in the usual directions, and audible over the rounded swelling. At the apex there was a long systolic bruit, conducted to the axilla, followed by a long rumbling bruit occupying the whole of diastole. No thrill was felt. Pulse 72, regular, of well-marked Corrigan type. Blood pressure 210/80. There was no pain or dyspnœa, and he could sleep well in any position. This condition remained the same, except that the oozing of blood from the hole slowly increased until June 16th, 1925. On this date there was a sudden severe hæmorrhage from the hole, which was eventually stopped by pressure. On the following day the aneurysm burst through the hole, causing death in about two minutes.

Post-mortem Examination.—All the organs were normal, except the heart and great vessels. The pericardium was very large, and was firmly adherent in front to the sternum and to the costal cartilages of the third, fourth, and fifth ribs on the right side. The pericardial cavity was completely obliterated, the two serous layers of the pericardium being united by dense fibrous adhesions. The right auricle and right ventricle and their valves were normal. There was well-marked hypertrophy of the left ventricle, but there were no vegetations or signs of old endocarditis on the mitral valve. The aortic valves showed profuse changes of syphilitic character, being fused at their base, shortened, and the edges thickened into a nodular roll. The sinus of Valsalva by the anterior cusp was expanded out to form a saccular aneurysm of circular shape, the entrance to the aneurysm having a sharp edge surrounded by great hardening of the aorta. The aneurysm, which was entirely intrapericardial, had passed anteriorly to the right auricle, becoming firmly adherent to it, and had then pushed its way through the pericardium, lying beneath the sternum, finally perforating the latter through a hole half an inch in diameter. The chief mass of the aneurysm had spread to the right, causing the large rounded swelling seen clinically, under which, at the post-mortem, the pericardium was firmly adherent to the chest wall. Beyond the aneurysm the aorta showed patches of syphilitic aortitis, but was otherwise normal.

The obliteration of the pericardial cavity, presumably as a result of his attack of rheumatic fever in 1914, had evidently prevented an intrapericardial rupture, as is common in this class of aneurysm. The aneurysm had pushed the anterior half of the pericardium against the chest wall, caused the two to adhere, and had then perforated externally through the pericardium lying beneath the sternum, and finally through the sternum itself.

FAMILIAL NEURO-SYPHILIS WITH APPARENTLY HEALTHY PARENTS.

BY A. G. DUNCAN, M.D. LOND.

THE following personal and family record illustrates several interesting points which bear on congenital syphilis.

D. X., the patient whose illness led to an investigation of the other members of her family, came under observation in 1921, when she was 22 years old. In the previous August, on ceasing work for the summer holiday, she had complained of general malaise, occasional vomiting, and slight deterioration of memory. The first sign of any serious ill-health was a severe and prolonged epileptiform fit, after which she was somewhat confused for a few days, and was then apparently well. On admission to hospital in November, 1921, she was mentally dull, lacking in attention, and emotionally unstable. The only physical signs of disease were a slight tremor of the lips, marked sluggishness of light reaction in the left pupil, and absence of tendon reflexes. Shortly after admission she had a series of fits resembling status epilepticus, and her mental condition considerably deteriorated. A positive Wassermann reaction in the blood, and the presence in the cerebro-spinal fluid (C.-S. F.) of 165 cells per c.mm., a positive Wassermann reaction, and the paretic type of colloidal gold reaction confirmed the diagnosis of dementia paralytica.

Her parents, brothers, and sisters were seen and examined clinically and serologically for any evidence of disease. The following notes give the record of the whole family.

Family Record.—R. X., the father; no symptoms; physical examination negative; W.R. negative in blood and no abnormalities in C.-S. F. on two occasions.

D. X., the mother; no symptoms; physical examination negative; W.R. negative in blood and C.-S. F. normal on two occasions. She had seven pregnancies:—

1. A., male, born 1894. Died in a mental hospital of dementia paralytica at age 26.
2. E., male, born 1896. No symptoms; physical examination negative; W.R. negative in blood; C.-S. F. normal.
3. D., female, born 1899. The patient described above.
4. F., male, born 1900. No symptoms; physical examination negative; W.R. negative in blood; C.-S. F. normal.
5. S., male, born 1902. Occasional headaches since receiving a blow on the head when 16 years old. Physical examination negative; W.R. positive in blood. C.-S. F. 12 cells (small lymphocytes) per c.mm., protein not in excess, W.R. negative, colloidal gold curve 001110000.
6. Miscarriage at sixth week in 1904.
7. H., female, born 1906. No symptoms; physical examination negative; W.R. negative in blood; C.-S. F. normal.

S. was given mercury and potassium iodide by mouth and courses of intravenous injections of novarsenobillon. C.-S. F. was completely normal when next examined, three months later, and has remained so. Positive W.R. in the blood persisted for 16 months, after which it remained negative. D., the patient who first came under observation, died in May, 1923.

Commentary.

There are several points of interest in this family record. The previous histories of the parents gave no indication of syphilitic infection, and the father denied having had a primary sore. It is difficult to imagine that the three children suffering from neuro-syphilis had unrecognised primary infections in childhood, so, in spite of the absence of any evidence of syphilis in the parents, it may reasonably be assumed that the disease was in each case inherited. Although there still appears in some text-books the assertion that an ovum may be infected by a spirochæte conveyed in a spermatozoon and so give rise to a syphilitic fœtus, it is practically certain that inherited syphilis is always an infection conveyed by the mother to the fœtus. In the case under consideration it is probable that the mother was infected by the father, and that their resistance or relative immunity prevented any clinical manifestations arising from the infection, though when this was conveyed to the children neuro-syphilis developed. The development of the disease in each case in the central nervous system may be an illustration of the preference for the nervous system which has been thought to indicate a special strain of spirochæte, but another possible explanation is that the nervous systems of the infected children were less resistant to disease than those of their parents. In this connexion it is interesting to note some evidence of inherent instability of the nervous system in the family of the mother, five of whom—father, two uncles, and two brothers—died in mental hospitals. There is lacking also that attenuation of virulence so often observed in the results of pregnancy in a syphilitic woman; the infection occurred only in alternate children, the second, fourth, and sixth having apparently escaped.

The result of treatment of the patient S. is not without interest. He certainly had some form of neuro-syphilis in its earliest stage—before the onset of symptoms or the presence of physical signs—and if left untreated he might have proved to be a case of dementia paralytica. So far, treatment has been successful in that the serological tests have remained negative for over two years. This record emphasises the importance of making a complete clinical and serological examination of the brothers and sisters of a patient found to be suffering from inherited syphilis.

I am indebted to Dr. George Riddoch for permission to publish these cases, and to Dr. P. Spark for notes confirming the diagnosis in the case of the patient A. X.

THE name of Mr. Townley Clarkson's collaborator in the article on Gonorrhœa in the Male, which appeared in THE LANCET of Jan. 16th, p. 119, should read W. J. Dwyer, M.R.C.S. Eng., Clinical Assistant, Venereal Diseases Department, London Hospital.

Medical Societies.

INCORPORATED ASSOCIATION OF HOSPITAL OFFICERS.

A MEETING of this Association was held on Jan. 15th at 28, Bedford-square, W.C., with Mr. G. H. HAMILTON in the chair, when Mr. SOMERVILLE HASTINGS opened a discussion on the

NATIONALISATION OF HOSPITALS.

He admitted frankly at the start the enormous service which the voluntary hospitals had rendered, not only to diseased humanity, but to medical science in general. Besides cultivating the spirit of help and hospitality they taught one most valuable lesson—that of coöperation in the treatment of disease. A patient in a large voluntary hospital had at his service not only physicians, surgeons, and specialists in all kinds of disease, but also those skilled in treatment by X ray, radium, light, and other special branches of curative medicine, as well as registrars, pathologists, and chemists. The success of hospital treatment was largely due to the scientific team-work of all these members.

Now the chief criticism of the voluntary system to-day was that this coöperation hardly extended outside the four walls of any one hospital. Each hospital is a law unto itself, and the public health suffered because the hospital worked as an isolated unit and did not keep touch with other hospitals and medical institutions in its neighbourhood. One hospital would have a long waiting-list while another near by had half its beds empty. They kept little touch also with the general practitioner, who at present sent patients to hospital without a very accurate history and received them on discharge without a detailed record of their progress and treatment. It would be much better if the patient's doctor could remain in touch with him while he was in hospital, and still better if he could take some share in his treatment. Another disadvantage of the present system was that public-spirited men and women had to dissipate so much of their valuable energy in inventing fresh schemes for collecting halfpence.

Shortage of Beds.

Nevertheless there were not too many hospitals, but too few. Hardly anyone realised how urgently the country needed more beds at the present time. The recent recommendation of the Voluntary Hospitals Commission for an increase of 10,000 beds greatly under-estimated the shortage. The necessary average was generally recognised to be 2½ beds per 1000 population; this meant 95,000 beds for our 38,000,000. Since, excluding the Poor-law infirmaries, the number available was only 50,500, the beds required were 44,500. The reason why the waiting-lists did not show this number was that doctors only sent their very urgent cases, as the others had little chance of entering within a reasonable period. For many reasons this demand was likely to increase in the near future. The health of town dwellers was inferior to that of country dwellers, and more and more of these were drifting to the towns. The increase of unemployment and the lowering of the standard of living was also making for more ill-health, and the housing shortage would make it more and more difficult for people who were seriously ill to be treated at home. Meanwhile the increasing complexity of medical science rendered institutional treatment indispensable for many patients if the best were to be done for them. The general public was becoming more interested in its health and less inclined to look on sickness as an act of God.

Decline of the Voluntary System.

The voluntary system had depended in the past on three things—voluntary subscriptions, voluntary medical service, and voluntary management. The last few years, however, the voluntary hospitals had been receiving an increasing proportion of their revenue from public funds. According to the late Sir Napier Burnett, the voluntary hospitals of England and Wales, excluding London, received in 1920 14·36 per cent. of their ordinary income from public authorities. Now that patients were paid for from public funds doctors who gave their help freely in the past were beginning to demand remuneration, and rightly, because the admission of middle-class paying patients was robbing them of much of their private practice. Voluntary management alone remained. Since the war the whole voluntary system had been in the melting-pot, and its history was a record of frantic attempts to save the sinking ship. Enormous lottery schemes, contributory schemes, payments by in- and out-patients, and grants from the Exchequer had been employed, and now the Voluntary Hospitals Commission were recommending a grant of two million pounds to equip more beds. This was not in itself objectionable if the hospitals used it to give help to all those in real need (which they did not always do at present), but if public funds were used the public must be represented both on the allocating committee and on the bodies that used the money. Voluntary levies from the employees in various factories did not benefit only those who subscribed, and a tax that fell on everyone in the district, well or sick, would be much fairer. Also, what with compulsory insurance, friendly societies, trades-unions, and the like, the wage-earner's income was in danger of being so reduced as to make a proper standard of life impossible, and he was therefore more likely to become a patient than he was before. Patients' payments were even more objectionable, as the very poor hated to admit that they could not pay and the better-off classes felt that if they paid what was asked, however nominal the sum, they were not accepting charity. The real pauper class for whom the hospitals were founded were thus being excluded, and it was among these that disease took the firmest hold and acquired fresh virulence to attack others.

Future of the Hospitals.

What was required to-day was a completely organised medical system throughout the whole country to give the best possible service free to everyone who wished it, and in each locality the hospital must be the centre of this scheme. Villages would have receiving centres with two or three beds; small towns would have local or cottage hospitals, and cases requiring special treatment would go to the county hospitals in large town or cities. National hospitals where medical students could be trained and exceptionally difficult cases treated were needed in London, Edinburgh, and other University centres. Each hospital would be the health centre of the district it served and be in constant and close coöperation with every other. There were already at Barry, Widnes, and Bradford hospitals controlled, supported, and administered by the local health authorities. Since these authorities were responsible for dealing with tuberculosis, venereal disease, and the treatment of school-children, it was essential that they should be able to control a certain number of beds. This change could only come gradually. First the Poor-law infirmaries should be taken over and run as first-class free hospitals with full visiting staffs, independently of the Poor-law. The voluntary hospitals should have the option of: (1) being taken over by the health authority; (2) remaining as they are; or (3) accepting a certain amount of subsidy with proportionate public representation. The deficiency of beds that would still remain could be made up by fresh building and by extensions. Country mansions that came on the market could be turned into convalescent homes to relieve the stress on the hospitals.

The mass of people were not content with things as they are, and no part of the Labour Party's programme received more applause than their hospital policy. The development of a National Hospital scheme was inevitable within 10 or 20 years, and his audience had two courses open to them. One was to resist this

movement and have to submit to a hurriedly conceived inadequate system like that of the National Health Insurance Act; the other was to direct and educate the popular will so that the new order when it came would retain all the best features of the present voluntary system.

Discussion.

Mr. R. H. P. ORDE (British Red Cross and Order of St. John) denied that the voluntary system had failed to "deliver the goods." It had proved its worth in the war, and if the hospitals were given the money they would continue to provide the admirable service they always had. Also, without the slightest intention of reflecting on the Bradford Hospital, it was obvious that even with unlimited funds at its back it could not compare with any of our voluntary hospitals. The hospitals might have been founded for the poorest classes, but except for the "middle class" the patients treated there came from precisely the same social ranks as they did a hundred years ago. The argument against the voluntary system that its hospitals had relied to a large extent on public funds was so ungrateful as to be incredible. These grants were payment for special work done; surely the hospitals had every right to them.

Mr. G. P. BLIZARD (Secretary, Public Health Advisory Committee of the Labour Party) said that he yielded to no one in admiration for the work that the voluntary hospitals had done for the country. Hospitals had been performing State functions all down the ages. No price was too high to pay for the treatment of disease, and hospital administrators should, like the Labour Party, think boldly of the net cost of their enterprises rather than of their actual outlay. The axiom "Penny wise, pound foolish" was truer in this branch of life than in most others. Nevertheless hospitals needed more coördination, as was shown by Sir Napier Burnett's illustration of three hospitals within a few miles of one another, one of which had empty beds, while the other two were overcrowded. Sir Napier Burnett had proposed to smash the hospitals into line, but the speaker wished to persuade them into line. It was a calamity that so many people should be unable to enter hospital. Treatment was much better in institutions, and a system of graded institutions should make it possible to treat all those people who were turned away through lack of coördination. The nation's requirement of beds, according to the finding of his Committee, was from 2–5 beds per 1000, and this brought the figure higher than Mr. Hastings's estimate. The deficiency was nearer 102,000 than 45,000, and the estimated cost £53,000,000. This would not come from voluntary subscriptions nor from contributions. Something far more radical must be done about the hospital shortage. The view of Labour was that it was bad for people to be so wealthy that they could afford to give large sums to hospitals, and that no self-respecting nation would let its hospitals depend on gambling lotteries and flag days. The distribution of wealth was at fault. All forms of contributory maintenance, like the compulsory health insurance, were in the nature of regressive taxation and fell most heavily on those who benefited least. The money for the hospitals should come from those who were suffering from being too wealthy. Cottage hospitals could be adapted from existing cottages or pairs of cottages in the same way as cottage baths had been in the North of England. The change would come more quickly than the 15 or 20 years Mr. Hastings gave it. The working of the Insurance Act had disclosed facts about ill-health that were irresistibly compelling the country to accept State control of all hospitals. The question was not now "Can we afford it?" but "Dare we not afford it?"

Mr. E. W. MORRIS (House Governor, London Hospital) admitted that hospitals were crowded too closely together and unsystematically distributed. This was because they had originally been founded for sentimental rather than practical reasons. While admitting the faults of the present system, however, he said there were other ways of correcting them than handing them over to the Government to manage. Everything the State had done for the poor since 1601, when the Poor-laws were introduced, it had done without sympathy. The Government's heartless handling of tuberculous patients was a good example; governments were too heavy-handed and inelastic to deal with such a personal thing as sickness. They could give valuable help to research, but an office stool was not the place from which to treat a sick child. A great advantage of the voluntary system was its elasticity, and in times of epidemic a hospital could throw open all its beds to patients of that particular disease without filling up forms and waiting for Government approval. Still more valuable than this, however, was the guest-house spirit of the voluntary hospital, which the infirmary did not possess. The first sign of improvement in the reorganised infirmaries was their adopting the name "hospital," but they needed the hospital spirit as well. He did not see why a health authority should be entitled to representation in return for grants of money; it was simply paying for service rendered. With all the faults of the voluntary system one day's voluntary treatment was better than a thousand years in the infirmary.

Mr. H. E. JENNINGS (Secretary, Chelsea Hospital for Women) said that if hospitals and general practitioners had to make compulsory reports to one another it would come very hard on both sides. Nowadays any questions that one asked the other were answered. The country, it was true, needed beds, but we were told that we were on our financial beam-ends and needed every penny we could spare for our industries; to impoverish the country was simply to create a demand for more beds still. Nationalisation would not only be very expensive, but would destroy the voluntary spirit, and the public should be told what they might expect if it were introduced.

Dr. ETHEL BENTHAM (Labour Party Executive and Margaret McDonald Hospital) complained that the voluntary system did not provide funds enough for the necessary accommodation, and that it was impossible to get a patient into hospital except an urgent or operation case. Half of these unsuccessful patients refused to go into the infirmary and had to be treated, for the most part quite unsuitably, at home. The infirmaries, although greatly improved, still left much to be desired. The whole Poor-law system must be revised. The voluntary system had done good work and been a necessary phase of advancing civilisation, but it could not finance a real preventive service such as we needed.

Mr. J. MCKAY (Hospital for Sick Children, Great Ormond-street) feared that Government control would ruin the hospitals as it had the telephone system. If the voluntary system were given the funds it could meet all demands, and Government control was not the cheapest way to get the results desired. The present system needed coördinating by a more efficient medical service, and he saw signs of a revolution in the health services of London which would lead to the desired reforms. When the Poor-law came into the melting-pot the Insurance Acts should go too; they worked very unfairly on the voluntary hospitals, who treated gratis many patients who paid health insurance. Hospitals had every right to recover this expenditure from the health authorities, who had plenty of money.

Mr. W. H. REED (Hospital Saturday Fund) said that the worker contributed to the voluntary hospitals with a willing heart. The patient of the State-controlled infirmary was charged more than he would be in hospital and was pressed till he paid; he was paying a poor-rate already and was taxed heavily for his treatment as well. The voluntary system came out of the war impoverished by the work it did; a grateful public had wiped out that debt and would do this one.

Mr. HASTINGS, in replying to the points raised in the discussion, said he did not blame the hospitals for accepting public funds. He was pleased, for this was the thin end of the wedge. Also nationalisation was not evil in itself. We had tried to fight the war without

it, and economic necessity had compelled us to nationalise one service after another. It was better that what money the nation had should be spent on hospitals instead of on mere luxuries, as so much was. The Poor-law and National Health Insurance were bad because they were framed only for one class; a really efficient service must be free and open to all. The measures against tuberculosis were bad because no government had spent enough money; the State handling of venereal disease and maternity welfare was good. It would not be impossible to carry over into nationalisation the friendliness that distinguished the voluntary system, for there was no reason why the people of goodwill who had built up this spirit should withhold their services when the hospitals were administered by the State.

SOCIETY OF SUPERINTENDENTS OF TUBERCULOSIS INSTITUTIONS.

AT a meeting of this Society held at 122, Harley-street, London, on Jan. 18th, with Dr. F. R. WALTERS, the newly-elected President, in the chair, a discussion on

OCCUPATIONAL THERAPY

was opened by Dr. J. E. CHAPMAN, who said that it was first necessary to define "occupational therapy," as all kinds of things were included under that term at present. He would define it as work provided to enable the patient to recover his health more rapidly than would otherwise be probable and to return him to his ordinary conditions of life mentally and bodily sound. Other considerations were secondary. The first work of this kind was introduced at Frimley and consisted of carting stones and small works in the garden, &c., without any economic considerations, but this soon changed to useful employment, and now the problem was still further complicated by the idea of vocational therapy. Every disease had its own problems of occupational therapy and it was impossible to legislate generally.

In Pulmonary Tuberculosis.

The psychological effect of occupational therapy, said Dr. Chapman, was much more important than the bodily effect. Patients were in institutions for long periods with nothing to do and were bound to be bored. The sanatorium had been described as "the breeding ground of loafers," but well-organised occupational therapy produced a contented community. At Woolley the patients did not work for their own benefit only; they received no money, but were made to feel that every ounce of energy they put into the work meant more cash to enable another man to be installed in the settlement. Physical benefit also accrued from occupational therapy; patients who had no exercise but walking, which usually meant a good deal of loafing, were liable to return to their homes soft. Very many of them broke down within a short period, and hence the idea arose of altering their occupation, usually to some country job, regardless of the fact that this would mean an inadequate income, so that soon they would drift back to their old work. Then arose the practice of training patients to some occupation suitable to their condition, but when they were turned out into the world they were almost always incapable of making good in it. Before they had always been employees drawing regular wages, but employers did not want them after discharge, and they had no notion of the commercial side of business and so failed alone. The speaker was sure that many of them broke down more because of the difficulties and worries of employment than from their home conditions. It was essential to arrange employment for them, as, for instance, in the "Spero" leather works where 23 men from the King George V. Sanatorium at Godalming were working; there had been no real breakdown since its inception. A certain Jewish institution had reduced its percentage of relapses from 50 to 15 by a well-organised and almost self-supporting workshop. Training must be arranged with the view of putting a man in some specific job in some specific place. A skilled trade like leather work was only suitable for about 5 per cent. of patients; for the 95 per cent. the "factory in the fields" at Leeds had offered what seemed a satisfactory solution. Here the men were employed on unskilled labour for as many hours a day as they were fit for, and the scheme was paying its way. Undoubtedly some form of unskilled work of the repetition order was best for the majority of tuberculous patients, and the sale of materials would always pay the wages of instructors and incidental expenses.

In Mental Disorder.

Lieut.-Colonel J. R. LORD said that it was impossible to get far in occupational therapy before coming across psychology, and to learn psychology it was necessary to go outside the usual text-books. "No man is born into the world whose work is not born with him" was a remark of James Russell Lowell, but many were uncongenially employed and their energy ill-directed and unproductive. That regular and congenial employment was essential to health and happiness had long been admitted, but it was only recently that occupation had been recognised as a factor in the causation and treatment of disease and mental unhappiness. Applied psychology would solve many social problems, most of which were due to the damming back of the basal instincts. Many physical disabilities led to a handicapped mental state—i.e., one in which the outflow of the psycho-physical energy was curtailed by physical or minor mental disabilities or both. For the prescription of vocational therapy it was essential that the physician should have a thorough and complete knowledge of the patient physically, mentally, and psychologically, and the requirements of the occupation must be correlated with the individual. The effects of the work on the patient should be systematically observed and noted, particularly with reference to his weight, appetite, bowels, sleep, personal appearance, posture, gait, &c. It was important to see that the amount of sleep obtained was proportional to the amount of energy required for the occupation. Occupational therapy was a powerful instrument in giving new interests, directing the psychophysical energy into new directions and breaking up bad mental habits.

There was, said Colonel Lord, no fixed boundary line between mental handicapping and mental disorder. It was difficult to tell whether there were a real organic change or merely a long suspension of function, but only a certain amount of re-education was possible. The best methods were simple handicrafts, mainly automatic movements. The basis was to try to get the muscles and physiological side going and to base an orderly habit of thought on the orderly movements with which it was coördinated in health and from which it was originally derived. The best form was a simple handicraft such as picking, tearing, or fraying, with materials pleasing to the eye. The work might be carried on quite automatically and unconsciously at first, but the patient became more collected, and later should be occupied in the work with which he was most familiar and could do most easily; the mind should be encouraged to flow along the channels of least resistance.

Occupational therapy, aided by sympathy and suggestion, was something more than diversion; in the confused and mindless there was nothing to divert. Diversion was needed for depression, anxiety, and certain neuroses where some control and ordered thought were retained. Vocational therapy was often harmful in these cases, as it worried the patients more. Simple games, exercises, and occupation calling only for muscular effort only helped them to sleep and digest. True vocational therapy was suitable for all convalescent cases, and helped them towards self-confidence and a new strength. Often their old occupation was gone and they had to face a new world and conquer it as best they could.

The same principles applied in chronic cases, although the ultimate objective was different. They were taught to employ themselves because it encouraged orderly conduct and induced content, helped the patients to maintain self-respect and individuality, put a brake on their deterioration, and stimulated a more normal flow of ideas. All institutional patients who had a particular form of mental handicap were liable to develop bad mental habits and a sense of inferiority, to become irritable, suspicious, antagonistic and often anti-social, and to fall an easy prey to quack doctors and agitators. They must be taught to work independently and not be pulled along by others. The work must be a united effort on the part of the doctor and social worker, helped when needed by an industrial psychologist or some such organisation as the National Institute for Industrial Psychology, which concerned itself with the problem of how to make the most of the individual and his work. A patient would take more interest in his work if it were useful and remunerative. Occupational teaching was best carried out in well-planned, well-ventilated classrooms.

Some Sanatorium Experiments.

Dr. JANE WALKER described the occupational therapy tried at the Nayland Sanatorium, confining herself to work done by patients while actually in the sanatorium. The first enterprise was lace-making, which faded away after some years of success. French gardening was more and more modified until it became simple English gardening; it failed because it was unsuitable for the tuberculous; it was far too monotonous, and the "ring" was too close to allow of obtaining a market. They were now running a weekly lorry to town with farm produce very successfully, but this was done purely as a business project. Embroidery involved an expensive plant and the work was too intensive; patients were not interested in work when it took a day to do an inch. Dress-making failed because one after the other had to give up the work and orders could not be carried out to time. Tailoring was even worse. Toy-making and boot-repairing were successful and were still carried out, but the latter did not pay its way. When the Government scheme for ex-Service tuberculous men was instituted, jewellery-making, furniture repairing, polishing, and watch and clock repairing were begun; these were still going on very successfully. They were now trying definite teaching of handicrafts, leather-work, simple stitching, &c., and, most recent of all, the making of bedroom slippers, which seemed to promise well. Handicraft met with much initial opposition but was becoming more popular. A first principle in employing tuberculous patients was that all possible situations about the sanatorium, such as maids, nurses, clerks, garden and poultry workers, should be filled by ex-patients, preferably from some other institution. Farm workers were best not drawn from ex-patients as the work was too heavy for them. No industry would pay if run entirely on tuberculous labour. Occupational therapy we must have, and if we failed with one method some other must be tried if the sanatoriums were not to turn out lazy and unemployable people.

Dr. ESTHER CARLING limited her remarks to the employment of ex-patients in institutions. This was the thing that seemed most valuable and worth while. Headway had been slow, and superintendents might help much by raising the question before their governing bodies. Twenty-eight out of 82 of her staff were ex-patients, and this represented the average they had maintained for some years. The quality of service was excellent. The disadvantages of breakdown and sick leave were obvious, but were insignificant beside the loyalty of these employees, a factor which few people outside recognised. No superintendents who had tried ex-patients ever went back on their choice, for they discovered its great psychic value. It was better than any kind of handicraft. Nevertheless, a combined effect was necessary to establish the principle firmly.

Dr. J. WATT attested the therapeutic value of work, not only in all kinds of ailments, especially the neuroses, but also to healthy people. A gospel of work preached by some eminent publicist would cure many social ills.

Colonel LORD mentioned the part played by the education officers and psychologists of an institution for neurotic soldiers in allotting men to therapeutic work suitable to them, and giving warning when an occupation was unsuitable for a certain patient.

Dr. VERE PEARSON stressed the value of walking, and said that occupation should not be allowed to exclude it. Sport was not only a valuable form of exercise but helped to prevent and cure tuberculosis. He had encouraged some of his patients to play on a putting green as an exercise.

The PRESIDENT gave warning against putting patients to work too early, and stirring up mischief in the chest and the "gambling spirit." Occupation was useful for patients still in bed with slight feverishness.

Dr. F. J. C. BLACKMORE pleaded for more coöperation between superintendent and tuberculosis officers, and for caution in founding new workshops.

Dr. NIVEN ROBERTSON mentioned the frequent breakdowns, and Dr. W. GOODCHILD the low morbidity of ex-patients employed on institution staffs.

Dr. W. C. FOWLER advised that the patient should be told the definite time he was likely to be kept in bed. When he knew this he used his time; when he did not he was inclined to loaf.

Dr. H. O. BLANFORD said that one of the chief obstacles to the employment of ex-patients was the opposition of the healthy employees.

Dr. J. D. STEVENS deprecated the misinterpretation of the clinical conception of graduated work by practitioners, who graduated to hold the patient's condition stationary and not to improve it.

Dr. JANE WALKER agreed with Dr. Carling's experience of the value of staffing sanatoriums with ex-patients: 120 of her staff out of 150 were ex-patients. Their employment outside institutions, however, was an insoluble problem.

Rebiews and Notices of Books.

CARBON MONOXIDE POISONING.

L'Oxyde de Carbone et l'Intoxication Oxycarbonique. By MAURICE NICLOUX, Professeur à la Faculté de Médecine de Strasbourg; Membre correspondant de l'Académie de Médecine. Paris: Masson et Cie. 1925. Pp. 256. Fr.22.

Dr. M. Nicloux may be congratulated on an excellent monograph. He states that he has been working on CO poisoning for many years and internal evidence indicates that he is a master of his subject. After the natural, technical, and laboratory sources of carbon monoxide have been reviewed, the chemical and physical properties of the gas are discussed and also its compound with hæmoglobin. The behaviour of hæmoglobin in known mixtures of oxygen and carbon monoxide under a variety of conditions and at varying temperatures is studied, and Dr. Nicloux shows experimentally that hæmoglobin in its combination with oxygen and carbon monoxide obeys the law of mass action. A large number of experiments are given on animals under varying conditions to correlate the percentage saturation of the blood with carbon monoxide and toxic symptoms, the author stressing the importance of what he calls the coefficient of poisoning, that is, the ratio between the percentage by volume of carbon monoxide in the blood and the percentage of carbon monoxide when the same blood is fully saturated. Treatment also receives attention. Some 70 pages at the end of the book are devoted to technique of the estimation of carbon monoxide and oxygen in blood and air, and the author critically surveys the various methods employed in such analyses, describing valuable apparatus of his own design.

Altogether an admirable little book.

PÆDIATRICS.

The Call of the Child. By A. DINGWALL-FORDYCE, M.D., F.R.C.P. Edin., Physician, Royal Liverpool Children's Hospital. London: A. and C. Black. 1926. Pp. 83. 2*s.* 6*d.*

THIS little book differs in some respects from the majority of those which have appeared on the same subject, and serves to exemplify the great variety of standpoints from which the study of child welfare may be approached. Its virtue lies in its clear presentation of the essentials upon which all schemes of management and treatment of children should be based. Questions such as infant feeding, dietetics, and exercise, on which so much has been written, are discussed succinctly and with a view to simplification. The most original part of the book is that devoted to the problems of the management of the ailing or crippled child, containing many suggestions of great practical use. A book of this kind is of particular value when it carries the authority of so experienced a pædiatrist; it may be recommended as confidently to parents and workers in institutions as to the medical profession.

Clinical Study and Treatment of Sick Children. Fourth edition. By JOHN THOMSON, M.D., F.R.C.P. Edin., Consulting Physician to the Royal Edinburgh Hospital for Sick Children. London and Edinburgh: Oliver and Boyd. 1925. Pp. 912. 30*s.*

Dr. Thomson has achieved notable success in the revision of his well-known text-book. The fourth edition has received numerous additions which have decidedly increased its completeness, while the style and arrangement of the book, which have rendered the previous editions so attractive, have undergone little change. A few sections have been added which are entirely new; these include descriptions of the exudative diathesis, erythrœdema, and the care of deaf, blind, and crippled children. The greater part of the new material has been incorporated in the text of the previous edition. The author's presentation of the disorders of the nervous system has hitherto been a notable feature of this work, and a large number of the new additions refer to them. The sections on encephalitis, cretinism, mental defect, and spastic paraplegia have been rewritten, and those on many other nervous disorders enlarged. We note that Dr. Thomson adheres strongly to the view, which has frequently been assailed of late, that the majority of spastic diplegias are natal, not prenatal, in origin. New work has been included in the accounts of pneumococcal peritonitis, rickets, and congenital syphilis, to mention a few only. The doctrines of Czerny and Finkelstein will still render the chapter on food disorders somewhat formidable to the student, but the nomenclature has been to some extent simplified. This work has gained considerably in comprehensiveness, and is thoroughly up to date; it is now of a size which makes it equally useful as a text-book and as a book of reference.

Feeding and the Nutritional Disorders in Infancy and Childhood. Fourth edition. By JULIUS H. HESS, M.D. Philadelphia: F. A. Davis Company. 1925. Pp. 556. $4.50.

THIS book by Hess is already widely known in America and in this country. In the three years that have elapsed since the last edition was published a good deal of work has been done on the principles underlying the artificial feeding of infants both in health and disease, and especially on the quantities needed of the individual food elements. This newer work is incorporated in the present edition, and some excellent diet sheets for children from 6 months to 6 years of age have been added. The author allows more cereals than is customary in this country—the giving of cereal waters to artificially-fed infants from 1 month of age, and cereal flours from the third month, is recommended—but in the section on rickets the danger of excess of starchy foods is duly pointed out. Nutritional disorders, the classification of which is on the newest lines, are fully and lucidly dealt with in eight chapters, one entirely new chapter on cœliac disease being incorporated in this section. This is probably the most valuable and the most original part of the book. Other sections, dealing with rickets, spasmophilia, scurvy, acidosis, and the anæmias of infancy, are equally authoritative. The volume is well illustrated and may be warmly commended to the medical practitioner as dealing in a common-sense way with the ætiology and treatment of the nutritional disorders of childhood.

Simplifying Motherhood. By F. H. RICHARDSON, M.D. New York: G. P. Putnam's Sons. 1925. Pp. 263. 7*s.* 6*d.*

THE author of this book has propounded a scheme of infant feeding and management based upon a number of hypotheses which in a large measure run counter to commonly accepted ideas on the subject. His enthusiasm for breast feeding will meet with general accord, but he may justly be suspected of overstating his case, and it is doubtful whether the cause which he advocates is well served by his estimation of the relative chances of breast- and bottle-fed babies at 80 and 20 per cent., or by the extremely disparaging account which he gives of almost every method of artificial feeding. Briefly summarised, Dr. Richardson's contentions are as follows: Every woman can nurse her child; it is impossible to overfeed a baby fed at an interval of three or four hours; the correct estimate of the sufficiency of the breast milk is obtained, not by the test feed, but by giving a complementary feed and allowing the infant to satisfy itself, this procedure being accompanied by manual expression of any remaining breast milk. The child is allowed to feed for as long as it will, even beyond the hour; is fed twice in the night, whenever it happens to wake, until the habit of sleeping through the night is acquired spontaneously. It is emphasised that this routine must be supervised throughout by a physician. The author recognises that his views will not meet with general acceptance, and he appeals to medical practitioners to give his method a trial. Probably the majority of them will prefer to do this before placing this book in the hands of parents.

A TEXT-BOOK OF PHARMACEUTICAL CHEMISTRY.

By ARTHUR OWEN BENTLEY, Ph.C., Director of the Department of Pharmacy, University College, Nottingham; and JOHN EDMUND DRIVER, M.Sc., A.I.C., Lecturer in Chemistry, University College, Nottingham. London: Oxford University Press. 1925. Pp. 456. 18*s.*

THIS book has been written to meet the needs of those studying for the Pharmaceutical Society's diplomas and for degrees in pharmacy. It is divided into two parts devoted respectively to inorganic and organic chemistry. The first part is concerned almost exclusively with the inorganic substances of the British Pharmacopœia, while in the second part, which claims to give a systematic account of organic chemistry, particular emphasis is laid upon substances included in the Pharmacopœia. The introduction states the intention that the reading of the book should be accompanied by a study of the corresponding portions of the Pharmacopœia. Parts of the volume, indeed, consist of transcripts of the Pharmacopœia, and in other parts it merely amplifies and explains those portions of the Pharmacopœia which appear to require such treatment. The scrupulous following of the Pharmacopœia has resulted in a somewhat superficial treatment of many branches of the subject—for example, the chapter on carbohydrates gives but an inadequate idea of the chemistry of this highly important group of substances. The book may be useful to students of pharmaceutics.

THE LANCET.

LONDON: SATURDAY, JANUARY 23, 1926.

TRANSFUSION OF BLOOD.

THE establishment of blood transfusion as a therapeutic measure in civil practice in this country dates only from the beginning of 1919, when war conditions were relaxed and those who had learnt the technique of transfusion were returning to their practices. During those seven years many thousand transfusions have been performed for a variety of conditions, and there is no reason for doubting that the results have given general satisfaction. It must be admitted, however, that on the medical side transfusion has definite limitations. Probably the great majority of medical transfusions have been done for pernicious anæmia, a disease which is never cured by this treatment though it may be held at bay for varying periods up to several years. The necessity for repeated transfusions is in itself confession of partial failure. The second prime indication for transfusion is hæmorrhage from a gastric or duodenal ulcer. The dictum that "patients never die as a result of hæmorrhage from a bleeding ulcer" may still gain some credence, but is gradually giving way before post-mortem room evidence. The fallacy of supposing that transfusion will encourage hæmorrhage by causing too great a rise in blood pressure is also losing ground. Transfusion has, in fact, proved its claim to be regarded as almost a routine measure in hæmorrhage from acute and chronic ulcers. In the first group it is more likely to assist in stopping bleeding than to encourage it, and accelerates the patient's recovery; in the second it tides the patient over a grave crisis and makes possible the performance of the necessary operation. Transfusion is also of proved value in surgery in combating the shock caused by any severe operation, such as partial gastrectomy or disarticulation of the thigh at the hip-joint, though it has become less often employed in the first of these examples as improved methods of anæsthesia have come into use. Another group of patients who may be definitely benefited by transfusion includes those suffering from chronic intoxication by pyogenic or other micro-organisms. The results of its use as a specific agent in these cases or in septicæmia by means of the principle of "immuno-transfusion" introduced by Sir ALMROTH WRIGHT and his co-workers in 1923, does not seem quite to have fulfilled the hopes based upon the laboratory work which suggested it; but the general effects of an ordinary transfusion have certainly been good. Opinion concerning the other less frequent indications for transfusion, such as melæna neonatorum, hæmophilia, purpura hæmorrhagica, and pneumococcal peritonitis, has not undergone any striking alteration.

Transfusion has probably been more freely used in hospital practice than outside, owing to the presence in hospital of greater facilities for obtaining apparatus and blood donors, but with a little forethought and organisation these factors do not present any real difficulty in any circumstances. Knowledge of the possible dangers due to the incompatibility of certain "blood groups" has been widely diffused, and misadventures attributable to this cause have been almost unknown. Probably very few transfusions have been performed without the preliminary tests which are known to be necessary. Doubt has several times been cast upon the precise truth of the statement that human beings can be rigidly divided into four groups, but although laboratory evidence may have fostered this doubt, clinical results have always tended to dispel it. In the department of technique no very striking advances have been registered, though several modifications of existing methods have been brought forward. The present issue of THE LANCET contains two contributions bearing on this side of the problem, and these will be seen to be to some extent in opposition. In the United States, the home of transfusion and the scene of many original investigations of the problems connected with it, discussion has always centred upon the relative merits of the use of so-called "whole blood" and of citrated blood. The advocates of "whole blood" have maintained that the use of citrate is to be held responsible for the minor post-transfusion reactions which have often been observed and that it should therefore be entirely abandoned. Advocates of citration have then demonstrated that the reaction follows in almost the same proportion of cases whichever method has been used.

The truth of the matter is difficult to seize, but the probability seems to be that the reactions are due to more than one obscure factor in technique and to peculiarities in individuals even in one blood group. The importance of the matter may easily be exaggerated, for the reactions are scarcely ever harmful, and some observers believe that the therapeutic result is better when a reaction has occurred. A statement that, in an occasional instance, a reaction has proved fatal is difficult to substantiate, for other possible explanations cannot be excluded, and general experience suggests that some other factor was probably responsible. The position, however, is arguable, and Dr. ROBERT PLATT, of Sheffield, now makes a plea for the routine use of defibrinated blood on the grounds that the technique is simple and that no reactions ever occur. He regards it as an established fact that the minor reactions are all due to citrate. Citrated blood has proved, however, to be, in some hands, so entirely satisfactory for general purposes that it will not be lightly abandoned in favour of another method. The citrate has also a somewhat paradoxical value as a hæmostatic agent when introduced into the circulation, and its continued use may be advocated on this ground alone. Our second contributor, Dr. H. H. MOLL, of Leeds, seeks to introduce a modification of the usual citrate apparatus, in which he uses a "Record" syringe fitted with a two-way tap. The same idea is incorporated in the apparatus used by Dr. PLATT. The point of difference lies in Dr. MOLL'S attitude towards the use of citrate, for far from questioning the propriety of employing it, he adds to the blood more than twice as much citrate as is usually considered necessary. Clearly no general agreement upon the pros and cons of citrate for transfusion has yet been reached. Disagreement, however, is not likely to prove so fierce in this country as it has done in America, for specialisation has not yet resulted here in the evolution of the "transfusionist" whose sole interest lies in the practice of this specialty.

MEDICAL RESEARCH IN 1925.

EVERY year an attempt is made to describe in small compass, in fairly balanced proportion, and in terms intelligible to those without special technical knowledge, the multifarious research activities being subsidised by the Medical Research Council. And every year, as the scope of these activities widens, the

task of summarising still further in our columns the highly condensed annual report of the Council becomes harder, if, indeed, a mere catalogue of names, places, and subjects is to be avoided. Such a catalogue in its proper place, which is the appendix to the report, certainly indicates the size of the net cast by the Council, and the curious treasures hauled in sometimes from unexpected sources. Here may be found, for example, a formidable list of investigation committees. Their terms of reference include Statistics, Biological Standards, Bacteriology, Problems of Child Life, Eclampsia, Vitamins, Nutrition, Dental Disease, Clinical Uses of Oxygen, Injuries of the Nervous System, Mental Disorders, Hæmoglobin, Tuberculosis, Salvarsan, Canine Distemper, Radiology, Biological Actions of Light, Chinchona Derivatives and Malaria, Physiological Actions of Alcohol, Anæsthetics, Pituitary Extract in Labour, Status Lymphaticus, Physiology of Vision, Legibility of Type, and Miners' Nystagmus. The existence of these committees depends for the most part on the gratuitous service of experts who are prepared to criticise without bias experimental, statistical, or clinical findings and to correlate, where possible, without attempting to control, individual enterprise. Some of the committees arise from the collaboration with the Council of other bodies such as the Pathological Society of Great Britain and Ireland, the "Field" Distemper Council, the Lister Institute, the British Empire Cancer Campaign, or a section of the Royal Society of Medicine. An index of persons working in close relation with the Council contains nearly 700 names. Ninety-one institutions in Great Britain and Ireland have supplied hospitality to subsidised workers or material for investigation, not including 28 Government departments or 35 other bodies, at home and abroad, who have coöperated in various ways.

It is clear, then, that no brief general survey of the research in hand could be adequate. However, in the year under review, as on former occasions, THE LANCET has been selected as a vehicle whereby much of the important work accomplished has been conveyed to the profession, and we may assume our readers to be familiar with the advances recorded in our columns. It is a different and more subtle affair for the general medical reader to assess at its true value any new discovery or technical method. The introductory chapter to the report of the Council, dealing critically with progress made in the study of immunity and infectivity, with the standardisation of biological substances, and especially with filter passers in relation to cancer, will be welcomed. For the development that excited most interest in all civilised countries during the past year was the publication in THE LANCET of July 18th, 1925, of the two complementary papers on this subject by W. E. GYE and J. E. BARNARD. It is unusual in a community as properly sceptical as the British scientific world for a preliminary communication still without independent confirmation to create such an impression. The Medical Research Council supply the reason; that the evidence brought forward by Dr. GYE resolves what they describe as the great paradox of medicine. Malignant disease occurs in all animals. Clinically and biologically it is an individual disease, maintaining its own characters whatever the scene of its being. Experimentally, however, it has hitherto been found impossible to propagate tumours except by a transference of living cells, and even then only to the same species. Experimental study, therefore, indicated a particularity or specificity of malignant tumours, while clinical and general observation had seemed to establish a uniformity and generality. Those who reflected on the subject from the clinical point of view were inclined to believe that some common causative factor must exist to link up the tumours of man and of the other animals. Those who worked experimentally tended, on the whole, to reject such a belief. If, however, the conclusion, supported by experiment, that the common factor for all malignant disease is a filter-passing virus, harmless by itself, while another chemical factor, without which no cancer can occur, is specific and is derived from tumour cells, is accepted, the anomaly disappears. The explanation offered is so attractive and fits in so well with each of the conflicting arguments that even as a theory it would have received attention; but here is no unsupported theory. Mr. BARNARD had set himself the task of devising special means for demonstrating the presence of a very small organism by ultra-violet light. The success of this work and of other developments of optical technique allowed the presence or absence in given preparations of the virus, as demonstrated experimentally by Dr. GYE, to be detected independently. Thus each part of the work could provide a check on the results of the other. The possibility of this cross-checking of the results gained on either side and its uniform success greatly increased public confidence in the results obtained.

The repetition and extension of the work in this and other countries is the next step. Coöperation with the staff of the Imperial Cancer Research Fund at the Stroud laboratory, which adjoins the Council's farm laboratories at Mill Hill, is already established, and will be facilitated by the proposed transfer of Mr. BARNARD'S department of applied optics from Hampstead to new buildings at Mill Hill. The sum of £10,000 in instalments of £2000 a year, allocated to the Council by the trustees of the late Sir W. DUNN, is being used for this purpose. Even at this stage the Council record their belief that "this new work transforms our outlook on the general problem of the causation of cancer."

CARBON MONOXIDE POISONING.

FEW substances have created such a wide interest in biology as carbon monoxide gas. It is of interest to the physiologist, to the pathologist and toxicologist, to the physician, to those concerned primarily with the welfare of individuals engaged in industrial and mining occupations, and to those responsible for the health of the general public. In a recent lecture [1] on the absorption and elimination of volatile substances through the lungs, Prof. YANDELL HENDERSON speaks of certain aspects of CO poisoning as it now affects the lives of all civilised men. He deals especially with the potential impairment of health and efficiency which may result from the pollution of the atmosphere with small amounts of CO such as may be contributed by the exhaust gases of petrol engines in congested regions of traffic. It has been found in New York City that concentrations of 1 part CO in 10,000 parts air are rather common, and from experiments on the rate of absorption of this gas by the blood of individuals exposed to varying concentrations of CO in air, it has been concluded that breathing in such an atmosphere for periods of several hours will lead to a percentage saturation with CO of an intensity sufficient to bring about slight symptoms of oxygen want. In garages and assembling and repair shops the conditions are increasingly bad, and the workers

[1] Brit. Med. Jour., Jan. 9th, 1926, p. 41.

suffer from asphyxial headaches and lack of mental control; whilst only last week Dr. A. G. G. THOMPSON drew attention in our columns [2] to unpleasant symptoms of similar origin which he has observed amongst engine-room workers on motor-driven ships. Drowsiness, headaches, vomiting, loss of appetite, and a yellow discoloration of the skin are amongst the results of engine-room life under the new motor régime, and this debility amongst men employed in motor works—whether ashore or afloat—obviously demands careful consideration.

The number of recent fatalities in garages has made it unnecessary, perhaps, to speak of the dangers of exhaust fumes as an acute poison, though the public is clearly still ignorant of the dangers of the closed garage door. The rich mixture of petrol and air used in starting a car is particularly noxious because the fuel does not undergo complete combustion. Prof. HENDERSON points out that the maximum efficiency of the petrol motor is attained when the ratio of air to petrol (by weight) in the gas mixture is about 15 to 1. Under these conditions complete combustion occurs. Unfortunately, it is with richer mixtures that the maximum power is obtained, and with carburettors adjusted to deliver 12 lb. of air to 1 lb. of petrol this further power output is only obtained at the expense of 6 per cent. CO in the exhaust gases. In Great Britain, owing to the tax imposed being made directly proportional to the rated horse-power of the engine, less highly powered cars are employed and hence the factors making for serious atmospheric pollution are considerably less potent than in the United States. The question will naturally be asked: What evidence is there that the extremely small contamination of the atmosphere with CO such as may occur in congested traffic areas can bring about any prolonged or permanent impairment in the efficiency of people exposed to it? Before attempting to answer this question we must inquire more fully into the nature of CO poisoning. CLAUDE BERNARD was the first to suggest that the cause of death in CO poisoning was anoxæmia, and though for many years the idea was prevalent that the gas had other specific toxic effects on the tissues, J. S. HALDANE demonstrated conclusively by experiments on mice that CLAUDE BERNARD'S contention was the correct one. The gas is not destroyed in the body; it can be recovered quantitatively from the expired air; and the well-known symptomatology of CO poisoning is due simply to the functional destruction of hæmoglobin for which the gas possesses a high affinity. The symptoms are similar to those of anoxæmia such as is found in mountain sickness. But whereas in the latter condition respiratory distress is a most prominent feature, in the anoxæmia of CO poisoning it seems to be the higher cerebral centres which are primarily affected, fainting being extremely common. This difference, as HALDANE points out, is due to the fact that the respiratory centre responds to changes in the *pressure* of oxygen in the arterial blood, and in even severe degrees of CO anoxæmia this may be normal.

The question may now be pertinently put that if in CO anoxæmia the oxygen pressure is normal but the functional hæmoglobin diminished in amount, why do not patients with degrees of anæmia far more severe than the functional anæmia resulting from CO poisoning suffer correspondingly acute cerebral symptoms of oxygen lack? The answer to this question follows from a consideration of the effect of CO on the dissociation curve of oxyhæmoglobin. The curve, as was shown by J. B. S. HALDANE, is shifted to the left, so that a given amount of oxygen can only be obtained under these circumstances by the tissues at a mean oxygen pressure considerably below that obtaining in cases of simple anæmia with the normal dissociation curve. It seems that in order to work efficiently the higher cerebral centres must be presented with a large supply of high pressure oxygen, and possibly the headache of anoxæmia is due to a protective capillary dilatation with extravasation of fluid from the blood to the tissues. There is, in point of fact, some evidence that this occurs in carbon monoxide poisoning. Our ignorance of the reactions of the cerebral capillaries, however, is profound; but it may tentatively be suggested that cerebral capillary dilatation and œdema occur in varying degree in conditions of anoxæmia, and that the petechial hæmorrhages which MOTT has described in the nervous system of those having died from CO poisoning are the extreme and pathological result of this call for oxygen by the master tissue of the body. In this connexion we must bear in mind the central and peripheral nervous symptoms—impaired cerebral control, disturbances of vision, peripheral neuritis—which frequently follow severe CO poisoning, and even mild poisoning if it be frequently repeated.

[2] THE LANCET, Jan. 16th, p. 157.

A CASE FOR CLEMENCY.

AT the quarterly meeting of the Council of the Royal College of Surgeons of England held on Jan. 14th a further application from Dr. F. W. AXHAM, for restoration of his Membership, was considered, but the Council did not see fit to rescind the resolution of July 13th, 1911, removing Dr. AXHAM from being a Member of the College. This meeting had before it a letter from Dr. AXHAM, stating that he fully appreciated the necessity for members of the profession to abide by the rules of its governing body and for those who find themselves in any circumstances unable to do so to accept the consequences. Dr. AXHAM went on to submit that he has now been more than sufficiently penalised, and to beg the Council as an act of grace to restore his name in the Membership roll of the College. The Council of the Royal College of Surgeons of England have finally declined to do this, and the decision has not been lightly taken, for great pressure has been put on the Council from many sides to reconsider their decision, and it has only been the conviction that in this matter they were the trustees of public safety that has determined their course. The application for restoration of Dr. AXHAM'S licence came before the Royal College of Physicians of Edinburgh on Jan. 19th, when by a resolution of the majority Dr. AXHAM'S appeal was granted. Lord DAWSON has already voiced the feeling of a considerable section of the medical profession that favourable consideration "as an act of grace" should be given to Dr. AXHAM'S reinstatement on the Register. The present position will not, we think, be construed as a change of policy in regard to the covering of unqualified practice, but rather as following the principle laid down in a memorandum, just issued by the Registrar of the General Medical Council, that, should a practitioner's name be erased from the Register, it may, after a lapse of time, be restored thereto, if that can be done with safety to the public. Presumably the legal difficulties to replacing Dr. AXHAM'S name on the statutory roll have been removed.

Annotations.

"Ne quid nimis."

DRUNK OR SOBER?

WITH the advent of the motor-car the problem of deciding in a given case whether a driver is drunk or sober has assumed an importance even greater than before. For the "one-'hoss shay" has been supplanted by the 20 or 40 h.p. engine, and the mentality of the horse, which by instinct avoids dangers and by training respects the footpath, no longer provides a buffer between the drunken driver and the innocent wayfarer on his route. In the days of horse traffic there was always at least one sober animal of the party. The drunken motorist, however, has no such assistance; he is a source of untold danger to all around him, and must be dealt with severely when guilty. It is in connexion with this subject that the paper read at the meeting of the Medico-Legal Society last Tuesday evening and reported on p. 207, is of especial importance. It records a practical attempt by Dr. G. Carter and Dr. H. W. Southgate, of Sheffield, to obtain definite data upon which the question of "drunk or sober" can be settled. Dr. Southgate shows, as the result of a series of experiments, that the curve of alcohol-concentration in the blood, after the administration of a known quantity of alcohol, is remarkably definite and constant in all cases. The curve of alcohol in the urine shows similar characters at a different percentage, so that, at any moment after the alcohol is taken, it is possible from an examination of the urine to make an approximately accurate estimate of the amount of alcohol in the blood at the same time. It is also possible within certain limits to say whether the alcohol-concentration is sufficient to cause drunkenness. Dr. Southgate's experiments are not only of interest from the physiological point of view, but they raise many problems which require investigation. The practical application of the method was dealt with by Dr. Carter, who reported a series of cases which had come under his notice as police surgeon, and gave particulars of some 25 cases, arrested for drunkenness, in whom the urine passed after arrest was thus examined for alcohol. So far the method has been tried in too few cases to warrant a final decision as to the extent of its value, but the results obtained are promising. It has at least a scientific basis and may prove a valuable help in this difficult problem. If it is to be really useful, the chronic hard drinker who can consume large quantities of spirits without change in demeanour would have to show a smaller alcohol concentration in blood and urine after dinner than that of the schoolboy who is excited and voluble after half a glass of port. Even now it might be of crucial assistance in certain cases. Thus a negative result would be an irrefragable proof of innocence, whilst one that was strongly positive would confirm the action of the police in making the arrest.

THE NEED FOR SPECIAL HOSPITALS.

THE establishment of a new special hospital for the prevention and treatment of heart disease in children is noteworthy as showing the movement towards the specialisation of hospitals. At its opening Dr. I. Harris discussed at some length the position to-day in large cities like Liverpool. It has become necessary, he said, that particular types of cases should be in charge of people with special experience, and as a general principle this can hardly be gainsaid. But in a place like Liverpool the existing hospitals are not large enough to be split up into special units treating special diseases. In some cities a great many hospitals have been built, and this dissipation of effort has meant that few of these hospitals are large enough to undergo internal differentiation of function. In Manchester, for instance, as was recently pointed out by Mr. L. G. Brock, of the Ministry of Health, there are 14 in-patient institutions. The Royal Infirmary and the Barnes Convalescent Home contain 750 out of the total 2045 beds for the city, but six of the remaining 13 have 50 beds or less. There are two ear, nose and throat hospitals, with 24 and 11 beds respectively. Can such an arrangement really make for efficiency? As Dr. Harris pointed out, the only solution of the problem where so many institutions are in competition is to pool resources of bed, scientific apparatus, and medical staffs. Some coördinating organisation is an essential, and there is no doubt that such a body, with its bird's-eye view, would soon be convinced of the futility of a method by which every hospital tries to treat every disease. Reorganisation into specialist hospitals would be the inevitable sequel. From the medical point of view it is obvious that to bring all the nerve cases of Liverpool under one roof, instead of letting them remain scattered about the city in the care of physicians not specially interested in them, would be to increase the efficiency of their treatment. And not of their treatment only, for there would also be improved opportunity for teaching and research. From the economic point of view another advantage would be a unified appeal to the public for funds. This might not be welcome to those hospitals which are successful in the scramble to raise money, but Mr. Brock is certainly right in saying that the present multiplication of requests for alms is not only wearisome and distracting to the public but is against the complete success of any one institution.

There are good grounds, then, both medical and financial, for thinking that specialisation of hospital function is overdue, though any drastic or sudden alteration in the present arrangements would be regrettable, because continuity of tradition is really valuable. Collaboration, rather than unification, is the ideal, and it is an ideal that is making headway. So far as children's diseases are concerned there has long been in Liverpool a measure of what Dr. C. J. Macalister has called "the federation of hospital treatment." An organisation exists there whose function it is to ensure that children shall go from a central out-patient clearing house to the institution most suitable to their needs, and elsewhere the large general hospitals are already learning to shift their patients into annexes and convalescent homes as early as they can, and are beginning to regard themselves to a certain extent as in-patient clearing houses. The idea is sound as well as progressive, provided that the needs of the patient are never forgotten in the search for a symmetrical organisation. Specialisation amongst doctors has its disadvantages, and they are very real. But specialisation amongst hospitals has few essential dangers and its advantages are incalculable.

LEAD AND ARSENIC IN TARTAR EMETIC.

A QUESTION of considerable interest is raised in our columns this week by Mr. E. Griffiths-Jones, chief chemist of the Public Health Laboratories at Cairo. How much lead and arsenic should be tolerated in tartar emetic? The harassed practitioner who naturally desires to know as definitely as possible what drugs he is administering will almost certainly say "none." According to Mr. Griffiths-Jones the manufacturers of tartarised antimony both in England and Germany appear to take a rather different view, which they base on the requirement of the British Pharmacopœia: "Yields no characteristic reactions for lead . . . [or] arsenic." The English firm say right out that all samples of the preparation examined by them contained about 0·1 per cent. of lead, whilst the German firm contend that their preparation does not contain lead and, further, that if it did, the B.P. tests would not detect it. This contention is not new. It has successfully been urged in the case of tartaric acid. The B.P. is a publication compiled under high medical authority and chemical advice. It cannot be admitted that the meaning of the requirement quoted above is that, when tested in a manner which cannot be expected to detect any

but ridiculously large proportions of lead, no lead shall be found. It would surely be reasonable to suppose that "no characteristic reactions" means rather that the proportion of lead shall be so small that it cannot be detected by any recognised means. The amount of lead actually found by Mr. Griffiths-Jones in one case exceeded 1 part in 1000 of the preparation. Taking the amount of tartarised antimony injected during a course of treatment for bilharzia as 25 gr. (1·6 g.) this would contain in such a case about 1/30 gr. of lead. The amount is small, but its presence might cause and apparently has caused complications which are not normal effects of the administration of antimony. Having regard to the extensive use of tartar emetic in treating bilharzia in Egypt, it seems clear that no uncertainty as to its properties should be tolerated. Let lead be administered as one of its salts, if desired, not as an impurity of another drug.

TWENTY YEARS OF SANATORIUM WORK IN FRANCE.

Dr. Guinard has brought out an illustrated book[1] to sum up and so commemorate the results of over 20 years' work and experience at the three sanatoria (the author prefers the plural sanatoriums) of Despeaux-Rubod (1903), with 120 beds for men; Petit-Fontainebleau (1909), with 108 beds for women; and Fontenay (1913), with 152 beds also for women, grouped under the designation Bligny and situated in the Chevreuse Valley, 25 kilometres from Versailles and 40 from Paris. The climate is pleasant and equable, and the surroundings ideal for the purpose. The site, formerly occupied by an ancient château, has historical associations with England. The three sanatoria (for the middle- and working-classes) are all distinct and separate, not even in view of each other, for the medical director is strongly opposed to a "mixed" sanatorium, not because the tuberculous necessarily develop more than normally affectionate tendencies, but because the mingling of the sexes would introduce an element of disturbance into the calm and ordered routine of treatment, which would be always inconvenient and at times might become dangerous. In this spirit also the regulation is enforced that the exercise-period of the men is made to coincide with the rest hours of the women, and vice versa.

The architecture of the buildings and the allocation of services are entered into in great detail. One noticeable point is that the balconies whereon the patients take their rest-cure are separate from, but in covered communication with, the cubicles and their "lavabos" and facilities for personal toilette, into neither of which do the patients return until bedtime. The patients' day is spent between the balconies—*galeries de cure*—the large general room for reading, writing, conversation, and games, and the park and grounds with croquet, skittles, and other games. Each patient spends on an average six hours in his or her rest-chair. The table appointments are met by coloured table-cloths to lessen the unsightliness of stains, separate serviettes and glasses, with racks for their reception in an annexe with toilet facilities. The diet is generous and is based on the average of that required by a healthy individual plus one-fifth. The menus read temptingly, and perhaps descriptive food terms are more alluring in French than in English, but *saumon mayonnaise* would sound excellent in any language, and we can imagine few patients, whose caprices are the despair of every sanatorium cook, grumbling at a meal which, beginning with *bouillon au tapioca*, proceeds through each dainty stage—*galantine et jambon, jardinière de légumes, gigot, tarte aux fruits*—to its consummation, *café*. Truly, says the doctor, "good cooking is the best aperitif!" And the patient has good wine, too, if he so desire. The medical, nursing, and auxiliary services are carried out on a fairly lavish scale—106 of a staff for 348 patients.

An important part of the volume is devoted to the lessons learned during these 20 years or so of sanatorium experience, and there is much of practical help in the matter of treatment, of tuberculin, to which the author assigns a definite though perhaps subordinate rôle, and of artificial pneumothorax. The doctrine of auto-immunisation through exercise and work, graded or not, is accepted with strict limitations, and the value of rest is emphasised and again emphasised. The man who delights in recording physical findings by the aid of coloured pencils and a multiplicity of dots, strokes, and demi-semiquavers will find everything to hand at Bligny, but, incidentally, the two chest diagrams in routine use there seem to us among the clearest and most convenient we have seen. The selection of patients is not too rigid, but it is Dr. Guinard's opinion that the period of treatment at a sanatorium is ordinarily too short, and he supports his opinion by some figures which, though not free from fallacy, seem to show that the after-results of treatment as expressed in terms of survival depend largely on the rest and the prolongation of stay in the sanatorium. The formation of a society of past and present patients, who meet annually at one or other sanatorium, with small subscription and numerous generous donations from the outside, enables the sanatorium to carry out some at least of the functions of a care association, and is a source of intense encouragement to those still undergoing treatment. The book is a splendid record of sanatorium work under a director whose heart and soul are in it, and might well form a guide to public and other authorities in this country who contemplate the erection and equipment of an institution which soars above the mere acquisition of a dismantled country-house and the throwing together of a few more or less dilapidated shacks with scanty staff and still scantier facilities for treatment. At Bligny are sanatoria of which the personnel may be proud, served by a whole-hearted devotion which spells success.

[1] La Pratique des Sanatoriums d'après les vingt premières années d'exercice des Sanatoriums de Bligny. By Dr. L. Guinard, Médecin-Directeur. One volume of 448 pages with 31 illustrations in the text and 32 plates: Bibliography and Index. Paris: Masson et Cie. 1925. Fr.60.

THE EAST AFRICAN MEDICAL SERVICE.

THE Council of the British Medical Association has now expressed the definite opinion that members of the Colonial Medical Services "can no longer place any confidence in the fulfilment of the terms on which they are appointed by the Secretary of State." This conclusion has been arrived at on the grounds that certain things have taken place in the East African Medical Service which may prove a precedent for similar happenings in West Africa or in the West Indies; and the two alterations which are considered by the British Medical Association to be prejudicial to the position of medical officers are the possibility of transfer when a permanent domicile had been promised or assumed, and restriction of private practice when the opportunities for such practice had been put forward as an argument for joining the services. We have received a copy of *East Africa*, a weekly journal published in London for the particular benefit of all having interests in East and Central Africa, and note therein a letter from a special correspondent in Nairobi which gives a view of the matter held by residents in Kenya.

"The action of the Colonial Office," he writes, "in amalgamating the several medical services of East Africa without notice to or the consent of the representatives of this colony is regarded here as a distinct breach of the promise that no steps towards federating the different territories should be taken without consulting Kenya's European inhabitants. This scheme also does not appear to be popular with the officers of our medical department, most of whom are comfortably domiciled in the colony, understand its conditions, and are naturally averse to transfer to distant, unfamiliar surroundings. At the request of our elected members, representations are to be made to the Secretary of State for the Colonies about this decision. It

is said here that the somewhat autocratic action already taken is due to the suggestions of some previously unheard-of advisory medical council."

It is quite clear that if the medical officers in Kenya entered the service on the understanding that they were not liable to be transferred from Kenya, a change of domicile upon official orders will be a breach of their engagement. In the case of some colonial medical officers it is contended that when they accepted their positions they knew that they were liable to be transferred from area to area; such officers will, of course, be in a very different position from those to whom a permanent domicile had been promised. That unification of the Colonial Medical Services, which for many obvious reasons is desirable, implies the transfer of medical officers from one area to another seems certain, and those joining the Services under the new regulations will understand what the position is. For those who entered the Services under pledges of different things compensation will have to be found if they suffer individually, while the position at Kenya merits particular consideration.

THE PROBLEM OF THE MONGOL.

FEW of the unsolved problems of psychiatry have excited so much interest and so many papers as that of the Mongolian imbecile. It is a problem that spreads into the realms of biology and anthropology as well as that of clinical medicine, and the fundamental ætiological question is how far the condition depends on the original composition of the ovum, and how far on the process and events of its development. The group is extraordinarily well defined and readily recognised; to examine one Mongol is to know all. Dr. R. M. Stewart, at a recent meeting of the Section of Psychiatry of the Royal Society of Medicine, gave a vivid word-picture of the Mongolian idiot that left no room for disagreement. The cranium is brachycephalic, small and smooth, with flattening of the occiput and, to a less degree, of the face. The well-known epicanthic fold is common in infancy, but is less common than an oblique fold of loose skin just above the upper lid. This formation appears to be due to a failure of the nasal bones to develop, which produces the short squat nose with depressed bridge and narrow forward-looking nostrils. The superior maxilla is also under-developed, and the palate is high and narrow; nasal catarrh and guttural speech commonly result. The prominent malar bones so characteristic of the racial Mongol are practically never seen in the Mongolian imbecile. The eyes are small and often squinted, and ptosis, nystagmus, and eye-rolling are common. Dentition is late and irregular. Highly characteristic are the fissures on the protruded tongue, developed after birth. Dr. Stewart, however, had seen these in other types of ament, several of whom were congenital syphilitics. The scalp hair is wiry and sparse, but the coarse skin of the body is covered with downy hair. The hands are curiously soft, with thick clumsy fingers, and the palmar markings are characteristic. The fingers and toes are often webbed and the feet are broad, short, and clumsy, and their blueness gives evidence of the heart disease which is so common in this form of idiocy. The spine is remarkably straight and the abdomen prominent, and the lax ligaments allow unusual mobility at the joints, so that the young Mongolian imbecile naturally sits cross-legged like a Turk. Herniæ are almost constantly present.

There is some evidence that the incidence is increasing: Dr. F. C. Shrubsall was able to give an analysis of 310 cases dealt with in London. Nevertheless, of pathology there is practically none: Dr. Stewart was unable to quote a single instance in which the nervous system had been examined really thoroughly post mortem. The smallness and under-development of the cerebellum described by most observers can be correlated with the shortened base of the skull. Dr. Stewart drew attention to the frequency of binucleated Purkinje cells in the cortex of the cerebellum; these are also very characteristic of congenital syphilitic aments. He had found no abnormalities in the blood picture during life in a series of 28 adolescent or adult Mongolians, but in half the series there was a lymphocytosis. There was a marked hypotension of the arteries in all but four, most of them giving a systolic reading below 90. As Dr. R. Langdon-Down remarked in the course of the discussion, it is hard to believe that so fundamental a change, involving practically all the structures of the body, epiblast, hypoblast, and mesoblast, could be due to any accident in development during embryonic life. Nor will any theory depending on some chance combination of the germ-elements account for the striking difference of the Mongolian idiot from all the other members of its own family, while resembling so remarkably all other Mongolian idiots, nor for the special position of the Mongol in the family. The parents are usually getting on in years, and in Dr. Shrubsall's series the father was very often younger than the mother; in 78 of the cases there was hereditary tuberculosis, and in 67 acquired psychosis or psychoneurosis. But on the whole there is nothing in the family history of the Mongolian idiot to suggest an inheritance worse than the average. In default of any evidence against the mother, Dr. Dora Berry and others have tried to incriminate the father as "sexually defunct," and Dr. Shrubsall drew attention to the frequent history of a use of chemical contraceptives. This would correlate with the appearance of the idiot at the end of a large family, as in the past it has most often been the parents of several children who have resorted to the use of quinine and other contraceptive drugs which might poison the developing embryo. This leads on to Jansen's theory of amniotic pressure, as the amnion would be most exposed to noxious influences at this period and its failure to develop might well compress the fœtus and arrest its development by raising the amniotic pressure. Jansen points out the similarities between anencephaly, achondroplasia, and Mongolian imbecility, and ascribes them all to this cause. The view that the condition is a Mendelian recessive and inherited as such lacks the evidence of adequate pedigrees. Perhaps the most-discussed theory of all is that of atavism recently put forward by F. G. Crookshank. For him it is the Mongolism rather than the idiocy which it is important to stress, and most observers agree that Mongol traits are often seen in the parents of the Mongolian imbecile. It may be that these act as determining factors; if such parents are going, for other reasons, to have an imbecile child the imbecility will take the Mongol form. The resemblance between the Mongol and the cretin has naturally produced an endocrine theory, but no pathological evidence has been obtained in support of this beyond the gonadal changes common in all cases of arrest of sexual development. The basal metabolism of the Mongol shows no abnormalities. There are, however, as Dr. W. A. Potts pointed out, people who believe that Mongolism can be prevented by administering thyroid and ovarian extract to the mother during pregnancy. It is difficult to understand how prophylaxis can be applied in any sense scientifically to so capricious a thing as Mongolism. A Mongol may be born of a perfectly healthy mother as her first, last, or intermediate child; both parents may be at the zenith of their reproductive power and subsequent children or even a twin may be perfectly normal. This very caprice has led to the syphilitic theory of its ætiology, as syphilis is known to act in just such an unaccountable way on mother and offspring, but neither Dr. Langdon-Down, Dr. Potts, nor Dr. Shrubsall were able to find any evidence for syphilitic inheritance in the majority of their cases.

It will be seen that the discussion merely served to intensify the darkness which surrounds this interesting subject. In many instances where several theories have been put forward it has been found that all had some measure of truth, but it seems unlikely on the face of it that a condition with such striking and well-defined features as Mongolian idiocy will prove to be the resultant of a series of ætiological influences.

INSURANCE FOR EDUCATION.

THE Educational Facilities Association has put out a scheme aiming to ensure the education of boys and girls in the event of their father's death, and all professional men, doctors among them, will find much that is attractive in the idea. Briefly, the scheme provides that for a small premium per term, in the event of the insured parent dying, the fees of a pupil at the school attended shall be met until the child is ready to leave. It is proposed that the premium shall be paid to the headmaster with the ordinary term fees, the first payment being made when the pupil enters the school. Preparatory, secondary, and public schools are included in the range of the scheme. A school, acting on behalf of a group of parents, will make the necessary arrangements, through the Educational Facilities Association, with an insurance company. At preparatory schools the benefits will be available for pupils up to the age of 14; at public and secondary schools up to the age of 18. Broadly speaking, the insurance can be effected for a premium of £1 on every £40 paid in school fees. It will be possible, in addition, to make special arrangements to insure a child's continuous education from preparatory to public school, and from public school to university. Those who are familiar with the organisation of Epsom College, and the splendid work that is done by the College in securing educational facilities for the children of dead or disabled medical men, where no provision has been possible for the purpose, will be in full sympathy with the idea. So long as the doctor's income is maintained he is able to support his children at school, but with the cessation of professional earnings in a large number of cases there is no income available to complete the upbringing of children in the manner which had been rightly planned for them by thoughtful parents. Any methods which will help to ensure for such children continuous education should appeal to all our readers. But while in accordance with this scheme they are paying a premium upon the school fees of children, they should support by subscriptions Epsom College, remembering that there will still be many children of medical men in whose case there will be difficulty in providing the premiums necessary to take advantage of the scheme of the Education Facilities Association.

A VARIOLOUS STORY.

AT a time when it is difficult to induce the population of this country to be vaccinated, it is refreshing to hear of the enthusiasm shown by the natives of a village in Palestine for even more drastic measures. In an entertaining article which we publish on page 212, Dr. J. Macqueen tells how he investigated a case of small-pox in a village in Palestine and took elaborate precautions for its isolation. He satisfied himself that there was no other case in the village, but it was not long before he learnt to his astonishment that the local medicine-man had taken the opportunity to engage in a little prophylactic work and had already inoculated 300 children with variolous material from this case. The practice of variolation is extremely ancient, but it was not apparently until Lady Mary Wortley Montagu had her son variolated in Constantinople in 1717 and described the procedure in her correspondence that it became popular in England and America. The method adopted in Turkey was to remove the contents of a vesicle (not pustule) and introduce it by means of abrasion, incision, or puncture. The material obtained from an inoculated case was preferred. The usual Chinese procedure was to plug the nostril with cotton which had been saturated with a mixture of water and pustular crustaceous matter taken from the eruption of a small-pox patient. Less commonly, fresh crust was powdered and blown into the nostrils through a bamboo pipe. The method in vogue in Palestine is to puncture the skin with a thorn through variolous matter spread on the surface. These various practices could only have remained popular because their effects were milder than true small-pox, and the death-rate cannot have been more than 1 per cent. or it would hardly have been tolerated in England. Why variola inoculata should be milder than variola vera does not seem altogether clear. Although, admittedly, virus introduced under the skin may find itself in an unfavourable medium for propagation, it might have been supposed from the recent work of Dr. Mervyn Gordon that inoculation through the mucous membrane of the nose would produce severe infection. In the Palestine experiments it seems probable that not all the inoculated persons were treated with virulent material, although the activities of the local doctor in Dr. Macqueen's story had sufficiently sensational results. Of the 300 children inoculated death occurred in 8·6 per cent. of those which developed an eruption, and in 3·3 per cent. of the whole number inoculated. But it is not to be supposed that this traditional practitioner roused against himself the fury of an antivariolation society. On the contrary, he seems to have gained nothing but kudos for his work, and certainly did not lose repute by the month's imprisonment which was its sequel. As Dr. Macqueen concludes, this Dawaimeh epidemic will have served some useful purpose if it acts as a reminder that a disease, variola inoculata, was once extremely popular; that Jenner superseded it with a better—vaccination; and of the problem why small-pox is such a severe infection when naturally acquired, so much less severe when inoculated, and so wonderfully harmless when passed through the calf. (It will be recalled that Dr. Gordon [1] thinks it probable that the vaccinia virus contains approximately equal quantities of the elements which produce cow-pox and small-pox—an opinion which supports those of Jenner.) As for Dr. Macqueen's narrative, it is possible to read between the lines that a difficult and threatening situation was met by him with skill, tact, and firmness. Even with such enthusiastic variolophils it was no mean achievement to get them to parade for a third vaccination.

THE NATIONAL INSTITUTE FOR THE DEAF.

THE National Bureau for Promoting the General Welfare of the Deaf was founded some 15 years ago by Mr. Leo Bonn, and for a number of years accomplished valuable work. Even during the war period when, like those of many similar organisations, its activities were half paralysed by the loss of expert assistance, its main object was kept steadily before the public. The need for a national recognition of the position of the deaf has long been urged by the supporters of the Bureau, and two years ago a movement for its reconstitution was started. This movement was publicly inaugurated at a conference in March, 1924, under the presidency of Lord Charnwood, when the outlines of the reconstituted body were considered and an executive committee was appointed to prepare draft articles of association. At this meeting Lord Charnwood was unanimously elected president of the reformed organisation; a representative group of vice-presidents accepted office, and an executive committee was selected to carry on industrial and social welfare work, to watch finance, to discharge generally the purposes of the Institute, and to coöperate with a strong medical committee. Mr. A. J. Story, headmaster of the North Staffordshire School for the Blind and Deaf, accepted the position of secretary, and those who know the work which he has done on behalf of the deaf will recognise the good fortune of the new organisation, now entitled the National Institute for the Deaf, in obtaining his services.

The report of the first year's working of the Institute has been circulated recently and shows that a great deal of preliminary spade-work has been accomplished, and in so short a space of time little more could be expected. The executive committee has been studying closely the industrial position of

[1] THE LANCET, 1925, ii., 826.

the deaf, the facilities—such as they are—that exist for their institutional treatment, the scope of any trusts or charities for their benefit, and any provision that exists for the instruction and supply of competent teachers. Apart from the record of performance the report makes interesting, if pathetic, reading because of the numerous and important places where the need for activity is demonstrated in order that the deaf subjects may have proper opportunity to prove their high measure of capacity to make good in life, given the necessary help at the start. The good objects of the Institute are clearly set out in the report and the promise at the beginning is fruitful, so that the necessary funds to carry on the work ought surely to be found. At present the Institute has an income of about £650 per annum, and one of at least £2000 is required to carry on the current work. If the facts set out in the report are realised by even a small section of the general public, annual subscriptions far in excess of this modest want would be forthcoming. And a much greater sum could be used immediately and with certain results.

VITAL STATISTICS FOR ENGLAND AND WALES DURING 1925.

THE Registrar-General has issued a provisional statement of the figures for birth-rate, death-rate, and infantile mortality (per 1000) during the year 1925.

—	Birth-rate.	Death-rate.	Infant mortality-rate.
England and Wales	18·3	12·2	75
105 county boroughs and great towns, including London ..	18·8	12·2	79
158 smaller towns	18·3	11·2	74
London	18·0	11·7	67

The smaller towns are those with an estimated population in 1921 of 20,000–50,000. The (crude) death-rate for England and Wales relates to the whole population, but that for London and the groups of towns to the civilian population only. The Registrar-General remarks that the birth-rate of England and Wales, as a whole, is the lowest recorded, except during the war years 1917 to 1918. The death-rate and infantile mortality rate are equal to those recorded in the previous year. These provisional figures, which are not likely to require substantial modification, have been issued for the information of medical officers of health.

THE first number of the Registrar-General's Weekly Return of Births and Deaths for 1926 is unchanged inside, but has a cover whose phrasing gives a more accurate idea of its contents, which include a topographical list of infectious disease notified in England and Wales. The welcome reduction in the price of the Return from 1*s.* to 6*d.* weekly should ensure the wide circulation which this invaluable document deserves.

INDEX TO "THE LANCET," VOL. II., 1925.

THE Index and Title-page to Vol. II., 1925, which was completed with the issue of Dec. 26th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CLVII.—THE TREATMENT OF SALPINGITIS.

I.—ACUTE SALPINGITIS.[1]

ACUTE salpingitis for all practical purposes is either gonococcal or streptococcal, and the latter nearly always follows labour or abortion. Further, whilst in gonococcal infections the inflamed tube is the one important feature, in the streptococcal cases the tubal lesion is only an incident in a widespread pelvic inflammation. Acute gonococcal tubes always arise as a spread of infection along the mucous membrane from the uterus to the tubes, whilst in streptococcal cases the tubal infection is secondary to a pelvic peritonitis, the organisms gaining access to the tubes either by the lymphatics or via the abdominal ostium. Thus it happens in practice that treatment is directed towards the tubes primarily in gonorrhœa, but towards a widespread but local peritonitis in streptococcal puerperal infections, the tubes being only of secondary importance.

Diagnosis.

In gonococcal cases much depends upon diagnosis. The diagnosis is often of great difficulty, the differentiation from acute appendicitis raising a problem very baffling to the surgeon. The localisation of pain to the right iliac region is not always so marked a feature of appendicitis as might be expected, nor is the pain of acute salpingitis always bilateral at first. In both diseases there may be involvement of large areas of peritoneum producing more or less generalised pain in the lower abdomen. The temperature, pulse-rate, and the occurrence of vomiting present nothing characteristic of either lesion. At the commencement of an attack, when time is so important in appendix cases, there may be nothing definite to be felt on abdominal or pelvic examination. On the whole, there is more to be discovered by a pelvic examination in acute salpingitis than there is in appendicitis. One particular sign is of great importance, and that is the acute pain which is evoked by attempts to move the uterus in tubal inflammations. Although not fixed at first, any movement of the uterus always produces great pain and is much resented by the patient. This is not so in most appendix cases, as long as the appendix and surrounding inflammatory focus are situated above the pelvic brim. In doubtful cases an examination under an anæsthetic should never be omitted, since it will often decide the diagnosis, bilateral thickening of the tubes and of the structures around them, definitely excluding appendicitis.

Another condition sometimes mistaken for salpingitis is a ruptured ectopic gestation, or tubal abortion. The history of the latter often decides the diagnosis, especially if a period has been missed, which is not always. The very rapid onset, the sudden pain and faintness, followed by a rapidly rising pulse-rate from internal hæmorrhage, and later the onset of vaginal bleeding (very important) make a clinical picture sufficiently pathognomonic of ectopic gestation and its acute results.

Operative versus Conservative Measures.

Once the diagnosis of acute gonococcal salpingitis is made, the question has to be decided whether an operation is to be performed or not. Seeing that the peritoneal inflammation which determines the acute attack is always localised, and that the risk of general peritonitis is practically nil, there is never the same necessity for immediate operation as there is in appendicitis. Moreover, the natural tendency of a

[1] An article by Mr. Stevens on the Treatment of Chronic Salpingitis will appear in the next issue of THE LANCET.

first attack of gonococcal salpingitis is towards spontaneous cessation of symptoms and resolution of inflammatory peritoneal exudates in about a fortnight.

The condition of the tubes, ovaries, and peritoneum after the attack has subsided varies enormously; in the majority of cases both tubes are enclosed in adhesions, with their abdominal ostia permanently closed. In a small proportion of the cases one or both tubes may remain patent and perform their normal functions, as shown by the occasional occurrence of pregnancy later. In another small percentage of cases the symptoms only ameliorate, the pulse and temperature never become normal, and on examination the tubes are found obviously enlarged, meaning that they contain pus. These are the only cases in which operative measures are imperative, and in them only when it is obvious that complete resolution has not taken place.

Certain authorities recommend immediate operation in all cases, the chief argument in its favour being that a large proportion of gonococcal cases suffer from recurrent attacks of pelvic peritonitis, that adhesions become more dense and widespread with each attack, that operations have to be done in the end, and that these late operations are more difficult and dangerous. These arguments are only partly true, for some cases never have recurrent attacks at all, others do not get very dense adhesions, and, on the whole, however difficult the late operation may be, the results are very good and the mortality is low. If an operation is done in the acute stage of a first attack the temptation to remove both tubes is very great, especially as they are usually enlarged and dripping pus from the abdominal ostium. It has been shown, however, that it is not necessary to remove these pus-dripping tubes. If they are freely slit up and the pelvis drained, preferably by a large tube through a small stab wound outside the rectus muscle, the results are very good. This is the treatment recommended if the abdomen is opened in a case in which it is doubtful whether the appendix or tubes are at fault, as will certainly happen on occasion to every surgeon. The histories of cases treated in this way will decide in the future whether tubes slit open will ever function normally, or whether there will be such widespread adhesions that conception is impossible. Further, also, it is not yet certain whether cases thus treated can be regarded as cured, or whether they may later have recurrent attacks of peritonitis. From these considerations it is advised that a first attack of acute gonococcal salpingitis and peritonitis should be treated on expectant lines, and operations only performed if complete resolution does not occur, and actual pyosalpinges remain. In the latter event an abdominal section must be done, taking care to pack off the intestines with a large swab or gauze roll to prevent any possible infection of the upper abdomen. Usually, both tubes will have to be removed, which can only be regarded as a calamity, especially as these conditions usually occur in young women. If it can be shown that these recent pyosalpinx cases can be treated safely by slitting up the tubes and drainage, true conservatism will be reached, and some of these tubes may recover sufficiently well to perform their functions. In all operations of this kind, where there is infection and where drainage is necessary, only absorbable catgut should be used as a ligature or suture material, so that there may be no sinus formation from infected ligatures.

Expectant Treatment.

The expectant treatment to be adopted is chiefly concerned with the relief of pain and the promotion of absorption of inflammatory exudates. Pain is best relieved by hot applications to the abdomen and hot vaginal douches of normal saline solution. Later, when pain is subsiding, counter-irritation may be employed in the form of ichthyol tampons or vaginal suppositories, also combined with hot douches, 10 per cent. ichthyol in glycerine for the former or 10 per cent. ichthyol in cacao butter for the latter being the usual method of prescription. Every other night is sufficient for the ichthyol, as it is easy to create a sore vagina by too frequent applications. At the commencement drugs are required to relieve pain, and heroin in small doses (gr. 1/12) answers very well; later, aspirin gr. x. and potassium bromide gr. xxx. by the mouth will suffice. The bowels must be kept open by enemata, and if necessary saline purgatives may be given. Absorption is promoted by hot-air baths, easily contrived in a private house by making a rough cradle to go over the abdomen and hanging in it two carbon filament electric lamps.

Acute Salpingitis of Streptococcal Puerperal Origin.

This is a minor consideration in itself, being quite overshadowed by the degree of local peritonitis present, and the almost constant lesion, ovarian abscess, accompanying it. Puerperal peritonitis is frequently generalised, and as such is practically always a fatal condition, it will not be considered in this article. If, however, the disease is localised, it may subside and resolve like the gonococcal variety. Frequently, however, this desirable result does not occur and suppuration results. In this event three conditions may have to be dealt with: free pus in Douglas's pouch, pyosalpinx which may be unilateral, and ovarian abscess. These lesions often cannot be differentiated before operation and often coexist. Sometimes free pus alone is found, in which case the posterior vaginal fornix will be found bulging downwards, the uterus being pushed upwards and forwards. In such a case the pus is best evacuated per vaginam. An incision is made transversely across the posterior fornix for one and a half inches, the finger is pushed up behind the uterus and the abscess cavity is entered. Blunt-pointed curved scissors may be used instead of the finger. A careful bimanual examination of the pelvis with the finger in the abscess cavity will decide whether there is an ovarian abscess in addition. If present, it is to be opened into the abscess cavity. Drainage is best accomplished by two tubes, side by side, sutured in place by fine catgut. Through them the abscess can be irrigated daily if they are left long and reach the vaginal entrance. In other cases where the temperature and pulse, wasting, and leucocytosis indicate pus formation, but no definite pelvic abscess can be felt, an abdominal operation must be done. Great care should be exercised to prevent general peritoneal infection, adhesions should be separated by cutting as much as possible. If the ovary is represented by a sac of pus it should be removed whole if possible, a pyosalpinx removed and drainage always employed whether any free pus is found in the peritoneum or not. As these cases are always the result of lymphatic infection from the placental site they are quite often unilateral, the appendages on the other side being unaffected. In a case of mine a normal pregnancy occurred three years after the removal of a large ovarian abscess, a pyosalpinx, and drainage of the resulting cavity. One trying complication of these cases is suppuration and breaking down of the abdominal incision. This can sometimes be prevented by protection of the wound surfaces during the operation by rubber sheeting, and by swabbing the wound with a non-irritant antiseptic such as Milton before suturing. Drainage should always be carried out through a stab incision lateral to the mid-line so as to allow of complete closure of the central incision.

THOS. G. STEVENS, M.D., B.S. Lond., F.R.C.S. Eng.,
Obstetric Surgeon, St. Mary's Hospital; Gynæcological Surgeon, Hospital for Women, Soho-square.

A GLASGOW NURSING HOME.—Dr. James Macfarlane, chairman of the Board of Glasgow Royal Infirmary, and his brother, Mr. George W. Macfarlane (both of Messrs. Macfarlane, Lang and Co., biscuit manufacturers of Glasgow), have presented that institution with 22 acres of land at Canniesburn, on the north-western outskirts of the city, as the site for a nursing home for those requiring treatment outside their own homes whose means do not allow of their paying the ordinary charges.

Special Articles.

THE PRESENCE OF LEAD AND ARSENIC IN TARTAR EMETIC.

BY E. GRIFFITHS-JONES, M.SC. MANCH., A.I.C.,
CHIEF CHEMIST, PUBLIC HEALTH LABORATORIES, DEPARTMENT OF PUBLIC HEALTH, CAIRO.

THE extensive use of potassium antimony tartrate, injected intravenously, in the treatment of bilharzia lends fresh importance to the question how far the elements lead and arsenic should be allowed in the drug. Some idea of the importance to which tartar emetic has attained may be gathered from the number of patients to whom it was given last year in Egypt. In all 54,316 patients were treated and the total number of intravenous injections was 311,656. The amount injected each time is 2 c.cm. of a 6 per cent. solution, and each patient receives in the whole treatment approximately 1·5 g. of tartar emetic.

Early in its use it was found that occasionally very severe symptoms arose as the result of the treatment, and it became incumbent on those concerned, before holding the tartar emetic responsible, to make certain that the unpleasant after-effects might not be due to some impurity in the drug used. In accordance with routine practice samples of tartar emetic were examined in these laboratories before being issued for use to the hospitals. The department is accustomed to insist that pharmaceutical preparations should conform to the requirements of the British or other recognised pharmacopœia.

It was very early established that several specimens of tartar emetic submitted for analysis contained either lead or arsenic or both. For many drugs the B.P. lays down a definite limit for lead and arsenic, and gives details of the examination for these impurities. There is accordingly no difficulty in accepting or rejecting such drugs, but tartar emetic is not included amongst those for which a lead and arsenic limit is given. The wording of the British Pharmacopœia (1914, p. 48) is as follows: "Yields no characteristic reactions for lead, copper, arsenic, iron, sodium, ammonium, chlorides, or sulphates."

Two leading firms of manufacturing chemists, one in England and one in Germany, have written to the department of Public Health, Cairo, on this question, and both adopt the same attitude in quoting the above paragraph from the B.P. in their favour. The British firm admit the presence of lead, but argue that all samples of tartar emetic, of different makes, which they have examined, contain 0·09 to 0·12 per cent. of lead; the German firm of manufacturing chemists say that their tartar emetic is lead-free and that, if it is not, there is no method of estimating lead in tartar emetic. The German firm argue in effect that if 1 g. of tartar emetic be employed and this quantity examined for lead by the tests given in the B.P., p. 492, no reaction will be obtained which will settle the presence or absence of lead. The contention of both these firms that tartar emetic should be examined for lead by the tests given on p. 492 of the B.P. is extraordinary in view of the obvious fact that the antimony would interfere with their application.

We have employed two methods for the estimation of lead, one colorimetric and one gravimetric. The colorimetric test is given in Squire's Companion to the British Pharmacopœia, p. 213. Twenty parts per million of lead will give an appreciable colour.

In order to make certain that the colour was due to lead and not to any other metallic impurity we have in certain cases estimated the lead gravimetrically, and for this I have worked out the following gravimetric process, which I believe to be accurate though somewhat tedious:—

20 g. of the sample were dissolved in a minimum quantity of water and then decomposed with a strong solution of caustic soda, the latter being added until the white precipitate formed had redissolved, after which a further excess of soda solution was added. H_2S gas was passed into this solution during several hours and the beaker then allowed to stand overnight. The black precipitate which had settled was filtered through a Gooch crucible, washed with ammonium sulphide, and finally with water. The precipitate was dissolved in dilute boiling nitric acid. Sulphuric acid was then added and the solution boiled until it commenced to fume, after which it was cooled, diluted, and allowed to settle.

The white precipitate which settled was filtered through a Gooch crucible and washed with 10 per cent. sulphuric acid and finally with water.

In some experiments this precipitate was assumed to be lead sulphate and weighed as such after drying. In others the precipitate of lead sulphate without drying was dissolved in a hot concentrated solution of ammonium acetate and the lead in the filtrate was precipitated with potassium bichromate solution as lead chromate. This solution and precipitate were boiled, cooled, and allowed to settle, and the precipitate was filtered on to a Gooch crucible, washed with water, dried at 110° C. and weighed as lead chromate.

In one case a sample was reported to me as containing 200 parts per million of lead when examined on 1 g. colorimetrically. By the gravimetric process I obtained the figure 198·7. In another case the report was "about 1200 parts per million." Determined gravimetrically the figure was 1266.

For detecting arsenic the U.S.P. and the P.G. employ Bettendorf's test, a colour reaction with stannous chloride, which depends upon a darkening of the reagent within a specified time if arsenic be present. The test is not very satisfactory, especially in view of the fact that the U.S.P. employ 0·1 g. of the tartar emetic and the P.G. 1 g.

The following method is used in these laboratories and appears to be reliable:—

0·5 g. tartar emetic is dissolved in 5 c.cm of water; 17 c.cm. strong HCl are added and the solution is transferred to a small distilling flask, when one or two drops of strong solution of stannous chloride are added.

The solution is distilled until only a few c.cm. remain. An adapter from the condenser dips into a very small quantity of cold water to absorb the HCl gas which first passes over. The distillate is redistilled, the last few cubic centimetres being rejected, and the second distillate is transferred to a suitable vessel; the arsenic, if any, is estimated by the Gutzeit process against a standard stain.

The limit which we have adopted for arsenic is 10 parts per million as estimated by the above process. The quantity of the limit of lead has aroused much controversy, but we maintain that lead-free tartar emetic can be obtained, that is to say, a salt which shows no colouration on 1 g. with NaOH and H_2S as described above. It is surely possible that even small amounts of lead—say, 50 parts per million—might produce toxic symptoms when injected intravenously in conjunction with antimony.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Jan. 28th Dr. H. C. Cameron will lecture on Catarrhs and the Catarrhal Child at 5 P.M. in the lecture hall of the Medical Society, 11, Chandos-street, London, W. The London Lock Hospital will hold a comprehensive course in Venereal Diseases from Feb. 1st to 27th, including clinical instruction and lectures. A two weeks' afternoon course beginning on Feb. 1st will be given at the Blackfriars Hospital for Diseases of the Skin. A combined course in Diseases of Children, in which the Paddington Green Hospital, Victoria Hospital, and the Children's Clinic will be participating, will be given from Feb. 8th to 27th. There will be morning and afternoon sessions in all the different departments of the hospitals. A late afternoon course (4.30 to 6) has been arranged at the London Temperance Hospital from Feb. 8th to 19th for the convenience of the general practitioner. A general intensive course in medicine, surgery, and the special departments will be held at the Queen Mary's Hospital, Stratford, from Feb. 15th to 27th. Daily sessions will be given at 10.30 A.M. to 5 P.M., including demonstrations of clinical methods and groups of illustrative cases. The syllabus of each of these courses, and the programme of the general course, may be had on application to the secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

REPORT OF THE MEDICAL RESEARCH COUNCIL, 1924–25.

THE eleventh annual report of the Medical Research Council [1] follows its immediate predecessors in general pattern. After an introductory comment on special aspects of the work under review, an account is given of the present constitution and activities of the National Institute for Medical Research at Hampstead. The next section is devoted to problems concerned with the determination of biological standards and the methods of biological survey and measurement, this year in relation to the provision of machinery for the operation of the Therapeutic Substances Act, 1925. Experimental medicine, notably the work carried out in the clinical units of various medical schools, is described in Section IV. Research schemes in special subjects form the substance of the longest section of the report. Though this grouping has only a temporary and provisional value, and must not be regarded as a permanent or rigid division, it serves as a convenient index to all sections of the report, since work already described on another page in connexion with various institutions is mentioned again in its appropriate paragraph. The system of cross references is well devised and is used with discretion. Notes on industrial medicine and industrial fatigue, on travelling Fellowships, and on changes of personnel in the Council conclude the report, while an appendix gives lists of standing committees, personal names, institutions, and subjects dealt with.

Constitution and Finance.

The constitution of the Medical Research Council is at present as follows. The Earl of Balfour, F.R.S. (chairman), Lord Mildmay of Flete (treasurer), Mr. William Graham, Sir Frederick Andrewes, F.R.S., Prof. E. P. Cathcart, F.R.S., Prof. Georges Dreyer, F.R.S., Prof. T. R. Elliott, F.R.S., Sir Archibald Garrod, F.R.S., Sir Charles Sherrington, F.R.S., Sir Cuthbert Wallace, and Sir Walter Fletcher, F.R.S. (secretary).

A grant-in-aid of £135,000 was provided by Parliament for the expenditure of the Medical Research Council during the present financial year. This sum will be allocated as follows: For administration, including expenses of the Council, of the administrative offices and staff, and of travelling, £8,500. For the expenses of the National Institute for Medical Research at Hampstead and of the farm laboratories at Mill Hill in association with it, for the salaries of the scientific staff and the expenses of research work done by them or by other workers temporarily attached, £42,000. For research grants to scientific workers and for the expenses of their researches at the universities and at other centres in the United Kingdom, for research work in clinical medicine, for various statistical inquiries, and for the investigations of the Industrial Fatigue Research Board, £84,500.

The Council acknowledge with gratitude that in the past resources additional to their Parliamentary grant-in-aid have been available for their use, either by the coöperation of other bodies or by the generosity of individuals.

Last year an introductory chapter was devoted to a survey of progress in physiology, pathology, and bacteriology in the years 1920–24. This year a critical discussion of the advances made in the year under review in the study of immunity and infectivity in general, in the investigation of the filter-passing viruses and of cancer, and in the determination of biological standards is supplied. The chapter gives a well-reasoned statement of the present position and outlook, which we print substantially in full.

[1] H.M. Stationery Office. 1925. Pp. 164. 3s. 6d.

Immunity and Infectivity.

No phenomena are more obvious and striking than those of the immunity won by the body after a first successful defence against a given infective organism, and no triumphs of medical science are greater in terms of humanitarian utility than those successful empirical imitations of this natural process which have given us the means of a broadcast anticipatory defence against small-pox, cholera, typhoid fever, and the like. This study of immunology has naturally attracted the eager efforts of workers in all countries, and immense accumulations of data have been collected. The scientific analysis of immunity reactions, however, offers extraordinary difficulties. Some of these reactions belong to the leucocytes, the wandering defensive cells of the body. The study of these, even in normal life, has been much neglected by physiologists, and this defect has been only partly remedied by the acute observations of pathologists who have studied them in disease. The experimental investigation of them, however, is a matter of extreme difficulty. It must still be uncertain how far, for instance, in the ingenious studies recently made in the service of the Council by Sir Almroth Wright, the behaviour of leucocytes under artificially controlled conditions outside the body is truly representative of their behaviour within the body. Not less difficult is the study of the immunity responses of the body shown in changes of the chemical and physical states of the complex fluids of the body. In this field has been studied the precise adaptation, the "specificity," of the chemical responses made to the attack of particular organisms of given type, or even of sub-type. Elaborate studies have brought into use names descriptive of particular parts of these phenomena, the so-called "aggressins," "agglutinins," "precipitins," and the like, into which these defensive chemical mechanisms can be sorted. That so much has been accomplished in the present imperfect state of biochemistry and colloidal physics is high testimony to the experimental skill of the pathologist. It seems clear, however, that for further clarity in these matters, for the explanation of disturbing contradictions, and for the issue in practical use of methods of precision, we must look to the better development and application of chemical and physical knowledge. This indeed is already in sight. An instance of it, among others that might be quoted, is ready to hand in the piece of work by Dr. H. W. Dudley and Dr. P. P. Laidlaw in the National Institute for Medical Research. Here it has been shown that part of the specific reaction of the body fluids to the tubercle bacillus and its products can be elicited by a relatively simple chemical substance of recognisable molecular structure. Advances of this kind, small as they may seem at present, are greatly needed for clearing away the ambiguities and disappointments that have attended all the efforts from those of Koch to those of the present day to secure at will an effective, regular, and measurable artificial immunity, whether in active or passive form, against tuberculosis.

Meanwhile, it has been interesting in recent years to notice an increasing study of the "infectivity" of the organism as contrasted with the immunity responses of the host. Intensive study is being made of the exact chemical conditions which either advance or retard the growth of the infective bacteria and the development in them of higher offensive powers or "virulence," and of the products of bacterial growth. Instances may be found of studies in this field by several workers with Sir Frederick Hopkins in biochemistry and by Dr. E. G. D. Murray in pathology, all at Cambridge, and by Prof. J. W. McLeod at Leeds.

On another side some striking recent studies have been made in this country which show the dependence of the infectivity of bacteria upon what at first sight seem to be almost irrelevant factors acting in necessary alliance with them. For a quarter of a century it has been known that some, perhaps many, of the microbes which are undeniably responsible in a causal sense for definite and grave diseases in man and other animals are in themselves completely non-virulent,

Introduced to the body in the absence of other agents they are quite harmless. Thus the bacilli of tetanus or their spores, if washed and implanted alone in the body, cause no ill-effects. Mr. C. Dobell showed that the amœba which causes amœbic dysentery is a common inhabitant of the human intestine in those who have never been outside this country; yet amœbic dysentery very rarely occurs in Great Britain. In disease due to organisms of several, perhaps of very many, kinds, the disease begins only if special circumstances are present, in which some change in the body, due to some other factor than the infecting parasite itself, has been brought about.

During the war Dr. W. E. Gye and Dr. W. Cramer studied this problem with immediate reference to wound-gangrene and tetanus. They discovered that a minute quantity of calcium salt, a common constituent of soil, acts on the body tissues in such a way that the otherwise harmless bacillus is able, with the accompaniment of this adjuvant chemical influence, to act with full virulence. Dr. Gye later showed, with Dr. E. H. Kettle, a parallel or analogous relationship between the infectivity of the tubercle bacillus and the effects of silica. The infective power of the bacilli, as shown by their unrestrained growth and its consequences to the host, was immensely increased if silica was associated with it in action upon the body tissues. This pursuit of a line of theoretic thought has immediate practical significance for the study and control of miners' phthisis, in which the most direct danger to life due to silicosis is that of the tuberculosis so constantly associated with it. Work of this kind must hold great possibilities in the future, and it will be seen that it has already assisted inspiration or at least provided suggestive analogies in the studies of cancer by Dr. Gye which have attracted so much attention in the past year.

Studies of Filter-passing Viruses and of Cancer.

It has been shown by Dr. Peyton Rous, of the Rockefeller Institute, New York, in 1911, that a rapidly fatal malignant tumour in a certain breed of fowls can be caused by an agent so small as to be able to pass through very fine filters that would hold back ordinary bacteria. The agent was believed to be a filter-passing virus. Dr. Gye has now provided experimental proof that this opinion is true. In the first place, he has shown that the agent in question can be shifted in fluids containing it by very rapid rotary movement—and is therefore corpuscular; in the second place, he devised means for the first time to cultivate the organism artificially, and so to use it in isolation for experimental work. He found evidence that the cultivated and isolated germ could not alone produce a new tumour, but only in the presence of an equally essential second factor, a non-corpuscular and therefore a non-living and soluble chemical substance which could be obtained from the substance of the previous tumour. The ultra-microbe together with the chemical factor ("specific factor") regularly gave a new malignant tumour. The microbe itself is quite invisible by ordinary microscopic methods. Mr. J. E. Barnard, however, devised special means for demonstrating its presence and for gaining some first approximations to its description by using ultra-violet light. The success of this work and of other developments of optical technique allowed the presence or absence in given preparations of the virus, as demonstrated experimentally by Dr. Gye, to be detected independently, and thus each part of the work could provide a check upon the results of the other. The possibility of this cross-checking of the results gained on either side and its uniform success greatly increased confidence in the results obtained. The preliminary results were published in THE LANCET [2] by Dr. Gye and Mr. Barnard in companion papers last July upon the Ætiology of Malignant New Growths.

This new work transforms our outlook upon the general problem of the causation of cancer. Observation, gross and microscopic, has shown beyond dispute that malignant disease occurs in almost all animals. Through all the range of the animal kingdom it begins in the same way in the form of a local swelling, almost always single; it spreads in the same way by permeation locally and by carriage in the streams of the flowing body-fluids to set up more remote secondary tumours elsewhere; it ends in the same way, in the death of the host. Microscopically a given variety of cancer in man, say of the skin, is the same as a cancer of the same tissue in a mouse, or a dog, or any other animal. The disease presents in that respect a uniformity which is almost without parallel in pathology. Clinically and biologically it is an individual disease, maintaining its own characters whatever the scene of its being. The experimental study of cancer, however, has hitherto not revealed any *nexus* between the tumours of different species of animals. It has been found impossible, for instance, to transfer the tumour of one animal—e.g., of a mouse to another mouse by any means except by transferring some of the living tumour cells; if the cells are killed by any means they can no longer reproduce the tumour. Moreover, the tumours of mice can even so be propagated only in other mice and in no other kind of animal. All attempts to show the existence of an agent separable from the living cells and able to reproduce the tumour have hitherto failed.

Experimental study had therefore indicated a particularity or specificity of malignant tumours, while clinical and general observation had seemed to establish a uniformity and generality. This has been the great paradox of medicine. Those who reflected exclusively from the clinical point of view were inclined, in general, to believe that some common causative factor must exist to link up the tumours of man and of the other animals; those who rested on the experimental findings tended, again in general, to reject such a belief. The evidence now brought forward by Dr. Gye resolves the paradox. In essence it suggests that the common factor for all malignant tumours is a filter-passing virus or ultra-microbe, or a family of viruses. It shows that this microbe alone is harmless, as the bacillus of tetanus is harmless in the absence of some other adjuvant factor. Only in special conditions, determined by another factor, can the microbe infect the body cells and institute a new growth, a tumour. Heretofore, it has been almost inconceivable that a separate form of cancer germ could exist to correspond with every race of animal and every different variety of tumour formation. If, however, the specificity resides in an adjuvant chemical factor derived from the tissue-cells of a given species of animal, specificity need not be postulated for the other essential agent—namely, the infective ultra-microbe or virus. It may be noted that among the conspicuous general circumstances which are well known to favour cancer production are those of long-continued irritation by tar and certain oils, chemicals like arsenic and aniline dyes, clay pipes, and so on. It may be found later that these apparently diverse contributors have a common mode of action and a common effective resultant factor.

The fowl sarcoma described by Rous is conspicuous among all transplantable animal tumours as being able to yield not only the virus or ultra-microbe but also a substance which determines "infection." The microbe can be replaced by microbes obtained from other tumours and from other animals. The demonstration of the truth of this is the essential feature of Dr. Gye's work, at this stage at least, and so far as the general cancer problem is concerned. It is a demonstration which the Council hope—and have reason to expect—will be repeated very soon in many laboratories in other countries.

It need hardly be pointed out that the establishment of a definitely parasitic causation of malignant disease brings new hope to the prospect of gaining further knowledge. Since an avenue is plainly open to the experimental confirmation and extension of these results, it is unnecessary, and indeed unadvisable, to speculate here upon the practical possibilities to which they may lead.

[2] THE LANCET, 1925, ii., 109 et seq.

The Council acknowledge indebtedness for material supplied to Dr. Gye, to Dr. Peyton Rous, and to Dr. J. A. Murray, F.R.S., Director of the Laboratories of the Imperial Cancer Research Fund. The experimental work of Dr. Gye and the optical work of Mr. Barnard have been actively taken up by the staff of this Fund with a view to their extension in the many directions now open. The proximity of the Stroud Laboratory of the Imperial Fund to the Council's Farm Laboratories at Mill Hill has greatly facilitated this coöperation. The Council are constructing additional laboratory accommodation at Mill Hill, to which, for the present at least, Mr. Barnard's department of Applied Optics, including the work upon ultra-filtration, will be moved from the National Institute at Hampstead. The trustees of the late Sir William Dunn have generously given to the Council, for the promotion of medical science, £2000 a year for five years, and this will be used in chief part for the advancement of these studies.

Biological Standards.

The enactment in August, 1925, of the Therapeutic Substances Bill is an event of much importance to the progress of medical science, to the daily practice of the medical profession, and to the safety of the public. The primary aim of the Act is to protect the public, both patients and doctors alike, by fixing standards for the strength and purity of complex substances like diphtheria antitoxin or like insulin, and, again, complex chemical compounds like salvarsan. These can only be assayed, or measured for their potency and purity, by indirect methods. Hitherto the doctor, betrayed by the absence of potency tests, has been in danger of quite inadvertently giving an overdose or underdose which may have serious or fatal results; or again, betrayed by lack of purity tests, he may often have exposed his patients to other dangers.

The arrangements proposed in the Act closely follow the present working arrangements for salvarsan and for insulin. These arrangements have only been made possible by the accident in each case that patent rights have been vested in a public department under which the enforcement of standards of strength and quality has been made possible. Salvarsan compounds have been manufactured and imported under licence from the Board of Trade owing to the outbreak of war in 1914, while insulin has been manufactured under licence from the Medical Research Council. All the salvarsan compounds since 1914, and all the insulin since its discovery in 1922, which have been used in this country have been tested for potency and purity by the Medical Research Council. By a fortunate coincidence in time, the work of preparing certain therapeutic standards, now required under the Act, has been facilitated by international agreements which have recently been reached under the auspices of the Health Section of the League of Nations. The second of two International Conferences upon the standardisation of biological products was held in Geneva early in September, 1925, when Great Britain, France, Germany, the United States, and five other nations were represented by distinguished pharmacologists. Unanimous international agreement was reached with regard to the standards to be adopted for such widely used and important substances as pituitary extract, insulin, thyroid gland, salvarsan, digitalis, and some remedies against parasitic worms. Valuable discussions took place and resultant arrangements for new work were made with respect to other substances in common use, but not yet susceptible of an agreed standardisation. The Council add that few international conferences in a field of such technical complexity and involving so many hitherto divergent national interests have reached within three days such felicitous agreement over a wide range of subjects, and attribute this happy result largely to the intellectual and personal qualities of Dr. H. H. Dale, who acted as president of the conference.

(*To be continued.*)

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Tetanus Anatoxin.

Ramon and Zoeller have just reported upon the effectiveness of tetanus anatoxin, which stimulates the formation of antibodies without being toxic. A series of some 170 injections showed that this method of vaccination is perfectly harmless, produces no local or general reactions, and effectually stimulates the formation of antibodies by the tissues. Two injections may be given, at an interval of 25 days. Ramon and Zoeller are continuing their studies on antitetanic vaccination.

Proposed Insurance Legislation.

A Bill has just been presented to the Senate for the compulsory insurance of wage-earners whose income does not exceed 12,000 francs annually, plus 2000 francs for every child. Persons insured will pay 5 per cent. of their wages, and employers will contribute an equal amount. The insurance is to provide against sickness, premature disability, unavoidable unemployment, medical and hospital care, old age, and the like. For pregnancy and childbirth it will cover the period of gestation and six months following accouchement, and will provide a daily indemnity extending for six weeks before and six weeks after childbirth. Insurance will cease to be obligatory at the age of 60 years, with possible prolongation to the age of 65. The worker will be assured of an old-age pension after continuing his 5 per cent. payments for 30 years, and this pension will supply a sum equal to at least 40 per cent. of the average income earned during the ten years preceding the age of 60. Proportional pensions will be awarded after an employment period of 25 years, and during forced unemployment the daily allowance will equal at least 40 per cent. of the usual wages.

This Bill considers medical relations more fairly than did an earlier draft, but it does not clarify the position of doctors as regards professional secrecy, and it is criticised on the ground that it does not provide for certain classes of workers. It is unlikely to pass without further amendment.

An Antitoxin against Cancer.

Maurice Bloch has presented 12 cases of cancer, including sarcomatous tumours, which have been cured or satisfactorily arrested by inoculating the patients with an antitoxin obtained from tumour cells in a state of fatty degeneration. The fatty tissue, which cannot be reproduced or act metastatically, is supposedly able to combat the toxins elaborated by cancers. The treatment was suggested by cases in which lipoblasts were seemingly responsible for the spontaneous arrest and cure of sarcoma and carcinoma.

Prognosis of Cancer of the Stomach.

From the results of 100 gastrectomies done by him during the last four years, Dr. Victor Pauchet, of Paris, has come to the conclusion that the presence of free hydrochloric acid in the gastric juice is a prognostic sign of great importance. Of 21 cases in which the acid was still present all but two recovered from the operation. Twelve of these have been since under observation and only two of them have relapsed rapidly in the first two years. In those with achlorhydria, on the other hand, the operative mortality was 22 out of 50. Thirteen are still under observation and six of these have relapsed rapidly. He sums up the situation by saying that in cases in which acid is present the mortality of operation is moderate, relapses are late, and the ultimate results are favourable. In this connexion it is interesting to note the recent death, from pulmonary congestion, of a man of about 70 who was operated upon for cancer of the stomach by Tuffier in 1898. The growth was then found on examination to be an epithelioma of the tubulo-racemiform variety. Prof. Hartmann has quoted similar cases and estimates that 30 per cent. of

patients in whom gastrectomy is done remain quite free from recurrence.

Recrudescence of Alcoholism.

Several recent communications have called the attention of the Académie de Médecine to an increase in the number of cases of alcoholism. Prof. Jean Lépine, of Lyons, draws particular attention to the evil results of wine drinking, whilst Dr. Cazeneuve (of the same city) insists on the bad effects of alcohol in all its forms. Especially he condemns the aniseed-flavoured apéritif and, above all, the substitutes for absinthe, which are becoming more and more popular. These beverages are forbidden by law, but actually they are advertised in the most flagrant way. They seem entirely to escape the control of the authorities, whose powers to suppress fraud are quite inadequate. An increase in the number of alcoholic patients in the lunatic asylums of the Rhône coincides with the increase in the consumption of liquor.

Free Hospitals and Foreigners.

An energetic campaign against the abuse of free hospital service in Paris is being waged by the French press, especially by the *Matin*. Gratuitous treatment and maintenance of undesirable foreigners throws a heavy strain on French finances, and the annual cost of free care of foreigners is estimated at 8 million to 10 million francs. At Paris 10 per cent. and at Lyons 13 per cent. of the children admitted to hospital are foreign, whilst at the Tenon Hospital 65 of 100 helpless tuberculous patients are foreign. During last year 275,000 foreigners were registered as arriving in France and probably 30,000 more entered the country without passports. This influx of undesirables not only burdens France and her taxpayers financially, but brings in trachoma, leprosy, and other epidemic diseases, and it seems likely that the campaign now on foot will result in legislation.

Lesions Produced Electrically.

At the meeting of the Académie des Sciences on Dec. 7th last Dr. Jellinek discussed the great differences between cutaneous and organic lesions due to electricity and those which are the result of simple burns. Severe lesions caused by electric current heal by aseptic necrosis; fever and alterations in the general condition occur but rarely. Amputations, he considers, are often done unnecessarily; conservative treatment is generally successful, even in the gravest cases. The prognosis in electrical lesions is usually favourable; not only do the skin lesions heal, but recovery tends to occur in the nerves and spinal cord when changes have been produced in them.

Prof. Achard, secretary-general to the Académie de Médecine, is leaving France for several months on a mission to Japan, which he is undertaking at the request of the Ministry for Foreign Affairs. He will carry to the Japanese medical profession the cordial greetings of their French colleagues and will consider how the two countries may be brought into more intimate intellectual relations. The French Government, desirous as it was that a doctor should visit the Japanese so as to encourage the spread of French science, could not have made a better choice.

Prof. Gosset, known internationally as a brilliant surgeon, has been named Grand Officer of the Legion of Honour.

Owing to the noticeable incidence of small-pox among civilians in various parts of France, the Minister of War has circularised the generals of the French army, insisting on special strictness in the vaccination and revaccination of recruits.

In Paris the new regulation closing pharmacies on Sundays and holidays is being strictly enforced; one pharmacy is maintained open for each arrondissement. A number of pharmacists who have kept their shops open in spite of the prefect's decree have recently been fined by the decision of the Cour de Cassation (supreme court), which reversed a previous acquittal.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Professional Secrecy.

THE German Criminal Code provides that medical men, as well as midwives, lawyers, and members of similar professions, are liable to punishment if, without being authorised to do so, they divulge facts with which they have become acquainted in the exercise of their profession. The maximum penalty is three months' imprisonment and a fine not exceeding M.1500 (£75). The term unauthorised—unbefugt—is essential. Even as a witness, according to the existing law, a medical man must decline to give evidence without the express authorisation of his patient, and when he is asked by an insurance company to give a certificate he is obliged to get the consent of the patient before complying with the request. In certain instances, however, a medical man may be obliged to act apparently against the principle of professional secrecy. It is quite evident that in notifiable diseases he must make the necessary declaration to the sanitary authority even in the face of the patient's objections, and this is not, of course, regarded as an unauthorised action but as one expressly authorised by the laws relating to infectious diseases. A medical officer to a school must also, as part of his duty, notify the school authority of the fact that a child is suffering from tuberculosis. But some situations are more doubtful. In a case in which a medical man informed the Government that one of his patients, who was in Government employ, showed signs of insanity, the Supreme Court decided that he was authorised to do so in the public interest, which must always have priority over the interest of the individual. It has also been decided that a doctor may, if necessary, disclose to the prospective father-in-law of one of his patients the fact that his patient is suffering from venereal disease. The Criminal Reform Bill, however, regulates the matter on a different basis. Hitherto a professional secret has been imposed only upon medical men, but the new Bill provides that everybody attending patients for money, even if not qualified, must observe the rules of professional secrecy. The medical attendant has to consider whether it may be in the public or private interest to divulge a fact of which he has become aware in his professional capacity, and in consequence the responsibility lies with the individual medical man. But even if a court concludes that he was wrong in divulging professional secrets he is not liable to be punished so long as he has done it after conscientious consideration of the pros and cons.

Frambœsia in the Dutch Indies.

In a recent lecture Dr. Winckel, of Java, described the results obtained with salvarsan in the treatment of frambœsia. The disease affects only half-castes and natives but never Europeans, and prevails in nearly all tropical countries; in some places 90 per cent. of the inhabitants are infected. In a campaign against the infection a quantity of 500 kg. of neosalvarsan was imported to the Dutch East Indies by the Government and 1,600,000 injections were performed. The symptoms usually disappear soon after the first injection, but for a definite cure three or four injections are necessary. In certain districts the disease is rapidly disappearing, but it will take a couple of years to destroy it throughout the Dutch Indies, which have 45 million inhabitants. The Government has had practically no expenses as the cure is very popular among the natives and they willingly pay for the drug, the syringe, and cannulas. Dr. Winckel has approached the Hygienic Committee of the League of Nations suggesting international measures for the destruction of the disease.

The Genesis of Fæcal Concretions.

Before the Berlin Medical Society Prof. J. Pick read a paper on the genesis of fæcal concretion in the

appendix. He has examined 500 specimens of fæcal concretions and has found that in 170 of them the nucleus was formed of hair. In 14 of them there was hair in the appendix without a concretion. The number of other foreign bodies found in the appendix was relatively small; 80 per cent. of the hair found was human in origin; 16 per cent. was derived from animals; and ½ per cent. from tooth-brushes. In the remainder the exact class could not be ascertained; 50 per cent. of all the concretions occurred in children up to six years of age, whilst concretions were found in 39 per cent. of cases of appendicitis in men and in 26 per cent. of women.

Distemper and Influenza.

Before the Veterinary Society Dr. Kantorowitsch lately read a paper on the connexion between distemper and influenza. The diseases, he said, are very similar. Both are spread epidemically and pandemically; the ætiology of neither has yet been ascertained, and they both produce symptoms of an obstinate character in the central nervous system. Together with Dr. Levy and Dr. Kuczinski, of the Pathological Institute, he has carried out microscopical investigations in dogs which died from distemper. In the brains of 22 dogs in which there had been cerebral symptoms he found a protozoon identical with that discovered at the Stockholm Biological Institute in people who had died from encephalitis lethargica. He has observed that in cases of distemper the proprietors of the dogs have often been suffering from influenza, and suggests that the dogs may possibly have swallowed the virus in the sputum of their masters. It has never been observed, however, that distemper is conveyed to the human species. Inoculation with the Swedish virus and the distemper virus gave nearly identical symptoms, so that at least a near relation between the two viruses seems likely.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The School of Physic, Trinity College.

THE 200th anniversary of the organisation of the School of Physic in Trinity College was celebrated publicly in 1912. Last week the College held a domestic celebration of the 100th anniversary of the opening of the Medical School Buildings, and Dr. T. P. C. Kirkpatrick delivered a lecture in the Theatre of Anatomy on the History of the School of Physic. Having recounted the vicissitudes of the School in the eighteenth century, he dealt in detail with the life of James Macartney. This great teacher and organiser was born in Armagh in 1770, and studied anatomy under Hartigan in the school of the College of Surgeons. Moving to London, he was appointed lecturer in comparative anatomy at St. Bartholomew's, where he won a brilliant reputation. In 1813 he was elected professor of anatomy and chirurgery in the School of Physic, and his election produced remarkable changes. An untiring worker, his energy irradiated the entire school. In seven years his class rose from 53 students to 303, and it became impossible to find room for them in the old Anatomy House. A new building had to be put up, and eventually the board consented to erect one on "the ground heretofore the bowling green." In its choice of site the board was probably influenced by a desire to keep the school buildings as far as possible from the rest of the college. Macartney appears to have been of rather hasty temper, for in an altercation with the architect he broke his umbrella on the architect's back. In spite of interruptions the building was finished, and on Nov. 1st, 1825, he delivered his inaugural lecture. Until the end Macartney maintained his supremacy, but his desire to rule the School brought about his fall eventually and he resigned in 1837. In the years that followed many great names were connected with the School. William Stokes held the post of Regius Professor of Physic from 1840 till his death in 1878. Robert James Graves, whose name was so closely linked with that of Stokes, was King's Professor of the Institute of Medicine from 1827 to 1841, and was, perhaps, the greatest figure in Irish medicine. Other notable teachers were William Featherston-Haugh Montgomery, Robert William Smith, Robert Adams, Thomas Brady, Robert Travers, and Robert Law. In 1874 John Mallet Purser was elected King's Professor, and at once began to lecture, not on medicine, but on physiology. In addition, he gave lectures on practical histology. These lectures became popular, and in 1879 the board authorised an expenditure of £2700 for the building of a laboratory for histology and physiology. Here was started that splendid instruction in practical pathology which was given by Dr. Purser every year till 1895, when Alexander O'Sullivan was appointed lecturer in pathology and the laboratory of pathology was built at the cost of £9000. Dr. Purser continued as King's Professor of the Institutes till 1901, and in 1917 he was elected Regius Professor of Physic. To Prof. Purser's energy and ability as a teacher, as Dr. Kirkpatrick remarked, the success of the school in later years has been in no small measure due.

Deplorable Salaries in Co. Mayo.

A serious position is arising in Co. Mayo owing to the failure of the County Board of Health to deal with the question of the salaries of their medical officers. Before the Board of Health took over the health administration of the county from the pre-existing unions a few years ago, scales of salaries had been adopted in some unions and not in others. There was no unity in the scales adopted, and some were more liberal than others. The Board of Health took over the scales as they existed, with the result that there is a complete lack of system in the salaries at present paid. Some salaries rise by scale to a maximum of £250 or £300 a year, whilst others only reach £140. One medical officer has an unchanging salary of £100. During the past few years the Board of Health has been repeatedly asked to adopt a scale of salaries for the whole county, but so far no notice has been taken of the requests. The inadequacy of the salaries is all the more distressing in that in the greater part of Co. Mayo there are little or no opportunities for private practice, and the medical officers are almost dependent on their Poor-law salaries. The medical officers have now put forward the demand that a scale equal to that in force in the neighbouring county of Galway should be adopted for Mayo. As the opportunities for private practice are better in the greater part of Galway than in Mayo, the demand is reasonable. In Galway the commencing salary is £250, rising by annual increments of £5 to a maximum of £300. If even such a modest scale were adopted in Co. Mayo it would mean an immediate increase of salary for every single medical officer in the county. Such a change would entail an increase in the rates of 2·1*d.* in the pound. Unless a speedy redress is given to the grievances of the medical officers there is a possibility of a general refusal to work.

The Irish Register.

It was announced in Dublin on Jan. 18th that the Free State Government proposes to introduce legislation next month to extend the existing arrangements with the General Medical Council for a further period of six months.

LIVERPOOL HEART HOSPITAL.—Appreciation of the importance of preventive treatment in heart disease has led to the establishment of a new institution designed especially to provide accommodation for prolonged treatment in bed for rheumatic and other conditions liable to produce cardiac lesions. A house at 34, Oxford-street, Liverpool, has been purchased and suitably equipped for the purpose. Two wards have been opened, as well as some single bedrooms, and the premises will be extended as soon as funds are forthcoming. An electrocardiograph has been installed. Dr. I. Harris has been elected hon. physician and Dr. Noel Chamberlain hon. assistant physician to the hospital, and with them is associated a number of distinguished members of the profession in a consultative or specialist capacity.

Public Health Services.

MENTAL HOSPITAL REPORTS.

THE *West Riding Mental Hospital* at *Wakefield* has just published its 105th report. Among the 2000 patients the death-rate was 9·04 per cent. for males and 8 per cent. for females, and the recovery rate 24. The recovery among females was much higher than among males, the analysed figures being 16·5 and 32·6 respectively. This is partly accounted for by the large proportion of general paralytics admitted, 14 per cent. of the male admissions being sufferers from this incurable condition, while senile decay accounted for 30 per cent. of the 190 cases which came to autopsy. Much renovation and general repairs have been carried out during the year, including a new motor garage and permanent marquee shelters in six of the wards. The recreation hall has been largely reroofed and a fireproof cinematograph projecting box erected. Many more improvements are still needed, however, in the words of the medical superintendent, "to transform what has in reality been an antiquated prison into a healthy and comfortable hospital." There are far fewer juvenile admissions than there used to be, although suitable treatment is not yet provided elsewhere for these cases, so that many types of mental disease fall between the Lunacy Act and the Mental Deficiency Act and so get but poor attention. The special school, Stanley Hall, has now 28 boys, and the value of the rugs, baskets, stockings, and other articles made by these children was nearly £40 last year. The pathological laboratory has undertaken a good deal of routine investigation and much histological work for teaching and research. Four cases of dysentery were detected during 1924, two of which had probably contracted the disease before admission. The training in practical nursing is now in the hands of a hospital-trained deputy chief nurse, and 15 men and 8 women passed the preliminary examination for the medico-psychological certificate; 36 of the staff now hold the final certificate.

The *Bucks County Mental Hospital* at *Aylesbury* had 670 patients in residence on Dec. 31st, 1924, of whom 468 were usefully employed. Ample provision is made for recreation and the fortnightly cinematograph entertainments and the wireless installation have been greatly appreciated. Parole and money grants have been given in a number of cases and are seldom abused. The recovery rate was 36·2 per cent. The death-rate was 11·2 per cent., an average figure attained as the result of an abnormally high male death-rate (18·6) and a low female rate (5·4)—the lowest for many years. Nine men died from influenza, which was epidemic in the spring. An electric cooking and baking apparatus has been installed, comprising four roasting ovens, two stock-pots of 20 gallons capacity, an egg-boiler for 80 eggs, a boiling table, fish range, grill, four hot cupboards with sliding doors, and two baking ovens to deal with 1000 lb. of bread in five to six hours. The newly appointed dental surgeon visits weekly. The visiting commissioner comments on the number of senile female patients and the necessity for accommodating such cases in infirmary wards, also on the presence of a few juvenile cases who would be better in mental deficiency institutions. With the aid of the chairman's generosity the needs of certain patients for spectacles are being attended to.

The report of the *Inverness District Asylum* shows a slight increase in the number of cases under care, the average number for the year being 674. The recovery rate was 23·5 per cent. and the death-rate 4·7 per cent., a very low figure compared with either previous records of this institution or with the general rate for Scottish asylums. Only one of the deaths was due to pulmonary tubercle, and one more to typhoid, of which there was a restricted outbreak in the summer. No definite cause could be traced. Increasing interest is being taken in the football matches, 18 of which were played during the last season, while the cricket team won five of its 11 matches. As yet there is only one voluntary inmate in this hospital. During the year ten nurses and two attendants passed the final examination for their certificate, two with distinction.

The county of *Hampshire* maintains two mental hospitals. That at *Knowle* had just under 1000 patients resident at the close of the year 1924–25, the number of admissions having fallen markedly during the last two years. The recovery rate was 48·1 per cent. and the death-rate 8·4, both figures showing distinct improvement on previous records. Post-mortem examinations were held on 75 per cent. of the fatal cases. The general health of the patients is showing steady improvement, particularly in respect of colitis, of which there were only five mild cases during the year, instead of an average of 74 for the years 1918–22. For this the new dietary arrangements instituted since the report of the departmental committee and the appointment, two years ago, of a visiting dentist, may be held largely responsible. The investigation of the nine cases of typhoid revealed eight carriers, which should lessen the future incidence. The tuberculosis rate remains the same. The newly installed cinematograph and wireless set have given much pleasure. The patients are encouraged to work about the hospital grounds and in the various shops and workrooms, and many useful articles have been made, particularly in the new basket-making department. Parole is extensively used. One ward is being reconstructed for the malarial treatment of general paralysis. Eleven attendants and four nurses obtained their certificate. The admission rate at *Park Prewett* has gone up and there were 1140 patients in residence at the end of the year. The recovery rate was 23·5 per cent. and the death-rate 6·96 per cent. The health of the patients was satisfactory and there were no epidemics. The hospital has wireless and cinematograph sets, and three detached blocks are used exclusively by patients on parole. A lady gardener has been appointed to supervise the women patients who can benefit from garden and poultry-farm work, while others are employed in the workshops and about the building. An automatic electrically-controlled continuous bath has been fitted up. Nine male and five female nurses obtained their certificate, bringing the total to 12 and 11 respectively.

The *Stirling District Board of Control* has over 800 patients in its institution at *Larbert*, including three voluntary boarders. The recovery rate for the year 1924–25 was 41·7 per cent., in spite of the fact that 46 per cent. of the admissions were incurables, 17 being senile cases, 16 general paralytics, and 15 mental defectives. Eighteen patients were sent out on probation during the year and only two returned as unsuitable. The death-rate was 11·4 per cent. and the cause was verified by post-mortem examination whenever permission could be obtained. There were no epidemics. Three cases of typhoid fever occurred, one of them in an advancing case of general paralysis. After the fever he was so greatly improved that he was able to return home and engage in his former employment quite satisfactorily. The farm is a most successful part of the institution, both financially and therapeutically, and it has been extended by the purchase of an estate of over 900 acres. It is hoped to establish a colony for mental defectives on this new estate, a most desirable procedure and one for which the need is pressing. It is now assumed that all nurses will take the M.P.A. certificate and they are not placed on the permanent list until the preliminary examination is passed. During the year nine nurses and eight attendants obtained their certificate. This is one of the institutions provided with a "tuckshop," much appreciated by the patients.

The *East Sussex County Mental Hospital* at *Hellingly* is one of the many mental hospitals which are overcrowded. It has 1165 patients, a slight increase on the previous year. The recovery rate was 41, and the death-rate 7·8 per cent. Seventy patients were sent out in the course of the year on trial, 36 with a

money grant of 15s. per week. Only six relapsed. A severe epidemic of influenza attacked patients and staff in the spring. Sporadic cases of scarlet fever and paratyphoid B also occurred, but dysentery has been considerably reduced. Antidysenteric serum has become the routine treatment. General paralytics had been treated by malaria for a few months only before the publication of the report. The physical drill classes for female patients have been very successful, both mentally and physically. Verandahs are to be erected and a new and excellent water-supply has been provided on the estate. A new operating theatre is to be provided; last year the visiting surgeons performed over 20 operations in an ordinary ward. An ophthalmic surgeon has been appointed and saw 390 cases during the year, while 757 attendances were made at the dental sessions. In many cases where septic conditions in the mouth have been rectified, considerable improvement has taken place in the mental and general health. About 50 per cent. of the patients are usefully employed. The laboratory has been thoroughly equipped and a pathologist appointed: he has been largely occupied with the investigation of dysentery, and points out that so long as open bucket latrines remain in the patients' courts cases of dysentery are bound to occur. The pass-lists in the nurses' examination for their certificate have improved since the appointment of a sister tutor, but, like so many other mental institutions, Hellingly finds it exceedingly difficult to find suitable female candidates.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 9TH, 1926.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 255 (last week 203); scarlet fever, 1759; diphtheria, 1042; enteric fever, 43; pneumonia, 1761; puerperal fever, 69; cerebro-spinal fever, 7; acute poliomyelitis, 4; acute polio-encephalitis, 2; encephalitis lethargica, 55; dysentery, 6; ophthalmia neonatorum, 114. There were no cases of cholera, plague, or typhus notified during the week.

Of the 255 cases of small-pox, 25 (last week 21) were reported from the county of Derby; 140 (last week 99) from the county of Durham, now widely scattered over boroughs, urban and rural districts; 11 each from the counties of Northumberland and Nottingham; 1 from the East Riding of Yorkshire (Kingston-upon-Hull); and 67 from the West Riding, 58 of which (last week 48) occurred in Rawmarsh.

Deaths.—In the aggregate of great towns, including London, there were 5 (1) deaths from enteric fever, none from small-pox, 72 (35) from measles, 16 (2) from scarlet fever, 39 (2) from whooping-cough, 53 (20) from diphtheria, 63 (17) from diarrhœa and enteritis under 2 years of age, and 114 (24) from influenza. The figures in parentheses give the numbers for London itself. The number of deaths from influenza is substantially less than last week—namely, 123 (27).

The Services.

SMALL-POX AREAS.

FLEET orders have been issued giving a recapitulation of the restrictions in regard to leave for officers and men proceeding to any town or district in which an outbreak of small-pox has been notified. For the present these restrictions operate in Ashington U.D., Bedlingtonshire U.D. (Northumberland); Blackwell R.D. and Derby (Derbyshire); Blaydon U.D., Chester-le-Street U.D., Easington R.D., Gateshead, Houghton-le-Spring R.D., Lanchester R.D., Ryton U.D., and Sunderland R.D. (Durham); Hucknall U.D. and Sutton-in-Ashfield U.D. (Notts); Kingston-upon-Hull, Middlesbrough, Rawmarsh U.D., and Sheffield (Yorkshire).

ROYAL NAVAL MEDICAL SERVICE.

Surgeon Rear-Admiral J. F. Hall, C.M.G., has been appointed an Honorary Surgeon to the King in place of the late Inspector General of Hospitals and Fleets, Sir Henry F. Norbury, K.C.B., K.H.S.

Surg.-Capt. W. L. Martin has joined the staff of the Royal Naval Hospital, Plymouth.

ROYAL NAVAL VOLUNTEER RESERVE.

The King has approved of the award of the Royal Naval Volunteer Reserve Officers' Decoration to Surg. Cmdr. D. D. F. Macintyre.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. R. N. Hunt, half-pay list, late R.A.M.C., retires on retd. pay on account of ill-health.

Lt.-Col. J. H. Robinson retires on retd. pay.

TERRITORIAL FORCE.

Lt.-Col. V. T. Carruthers (Maj., Res. of Off.) resigns his commn. in the T.A. Capt. F. G. Lescher to be Lt.-Col. and to command the 137th (North Midland) Field Ambulance.

ROYAL AIR FORCE.

John D'Isney Rear is granted a short service commission as a Flying Officer for three years on the active list, and is seconded for employment at Royal Sea Bathing Hospital, Margate.

INDIAN MEDICAL SERVICES.

The services of Maj. J. B. Hanafin, officiating director of public health, Assam, have been placed at the disposal of the Government of India. Maj. J. L. Sen, M.C., has been confirmed as a Civil Surgeon, Assam. Lt.-Col. F. L. Wilson officiates as Residency Surgeon and Chief Medical Officer, Baluchistan, vice Lt.-Col. L. J. M. Deas on leave. Maj. W. O. Walker has been appointed Civil Surgeon, Serampore. Lt.-Col. H. G. Stiles Webb has been reposted as Officiating Director of Public Health, Central Provinces. Lt.-Col. W. Davis to be Civil Medical Officer of Ranikhet, vice Maj. T. T. H. Robinson. The following have been granted leave: Maj. E. C. Doyle, acting Inspector-General of Prisons; Maj. E. S. Phipson, Health Officer, Port of Aden, and Medical Officer, European General Officer, Aden; Lt.-Col. W. O. S. Murphy, Director of Public Health, Government of Bombay; Lt. H. B. Rosair, Superintendent of Jails, Fatchgart. Maj. B. F. M. Newland, civil surgeon, has been granted an extension of leave. Lt.-Col. W. R. Battye has been posted as Administrative Medical Officer, Central India, and Residency Surgeon, Indore, vice Lt.-Col. J. R. J. Tyrrel, granted leave. Lt.-Col. J. Cunningham, late Director King Institute, Guindy, has been appointed Director of the Pasteur Institute of India. Lt.-Cols. C. A. Sprawson, Principal, King George's Medical School, Lucknow, and J. Hunter, civil surgeon, Lucknow, have been appointed members of the United Provinces Medical Council, vice Maj. G. J. Burke and Lt.-Col. Hugh C. Buckley. Lt.-Col. G. Tate, Officiating Inspector-General of Civil Hospitals, Punjab, has been appointed Principal and Professor of Surgery, King Edward Medical College, Lahore, vice Lt.-Col. H. H. Boone, granted leave. Capt. S. W. Hayes, civil surgeon, Dalhousie, has been appointed Professor of Operative Surgery, King Edward Medical College, Lahore. Capt. G. E. L. Simons acts for him. Lt.-Col. W. D. Ritchie, civil surgeon, Darrang, has taken over charge of Jagpur Jail from Maj. J. F. James. The following have been granted leave: Lt.-Col. J. G. N. Stokes, Director of Public Health, United Provinces; Lt.-Col. W. J. Powell, Inspector-General of Prisons, Central Provinces. Maj. H. H. King, Director of the Pasteur Institute of India, officiates as Director of the King Institute of Preventive Medicine, Guindy, Madras. Lt.-Col. C. L. Dun, Director of Public Health, United Provinces, has been appointed a member of the United Provinces State Board of Medical Examination, vice Maj. W. A. Mearns, resigned. Lt.-Col. J. W. D. Megaw, Principal, Calcutta School of Tropical Medicine and Hygiene, has been appointed Honorary Surgeon to the Viceroy, vice Col. R. P. Wilson, late Acting Surgeon-General with the Government of Bengal. Maj. P. M. Rennie, civil surgeon, has been appointed to the executive and medical charge of the District Jail, Hoshangabad.

Dr. H. W. Gush, senior medical officer, West African Medical Staff, has been appointed to be a surgical specialist in the Gold Coast.

GLASGOW ROYAL INFIRMARY.—The annual report states that the managers are considering preliminary steps towards the establishment of a new biochemical department, and that the Muirhead trustees have enabled them to establish two post-graduate research scholarships for medical women of £100 each, tenable for a year, and renewable at the option of the trustees. There were nearly 14,000 in-patients, an increase of 1200 on the previous year, and nearly 52,000 out-patients, an increase of 3261. The ordinary expenditure was £110,000, and the year's deficit £25,000.

Correspondence.

"Audi alteram partem."

ACUTE HÆMORRHAGIC NEPHRITIS.

To the Editor of THE LANCET.

SIR,—The interesting study of acute hæmorrhagic nephritis in children by Dr. W. G. Wyllie and Dr. A. Moncrieff which you publish this week, brings to notice an aspect of nephritis which has been overlooked by many writers on renal disease. Several years ago my attention was drawn to the occurrence of severe grades of hæmaturia in the course of what could be regarded clinically as nothing else than subacute or chronic parenchymatous nephritis—to use the classification of nephritis commonly accepted in this country. Since that time I have observed 17 examples of the condition, all the patients being in the clinic of my chief, Prof. W. K. Hunter, at the Glasgow Royal Infirmary. I hope to publish the records of these cases shortly, but a brief reference to them may be of present interest in connexion with the paper by Dr. Wyllie and Dr. Moncrieff.

My cases have a general resemblance to those which they describe, but differ from them in that (with two exceptions) the patients were all young adults. Excluding one patient 8 years old and another 54 years old, the ages ranged from 15 to 40, and most of the patients were between 15 and 30 years of age. The hæmaturia was often very copious and in many instances it persisted over periods of weeks or months with only occasional intermissions. The longest continuous record of hæmaturia in the series extends over 18 months, but there were other cases in which the bleeding had not ceased on dismissal from hospital.

That abundant blood in the urine is by no means a rare symptom in nephritis is shown by the fact that in a series of 100 consecutive cases of nephritis of all types admitted to Prof. Hunter's wards I found the following incidence of hæmaturia: No hæmaturia 44, hæmaturia lasting not more than seven days after admission 19, hæmaturia lasting eight days or more 37 cases. Further analysis shows that of the 37 cases with persistent hæmaturia some were examples of acute nephritis (primary attacks of exacerbations of a previous nephritis) and some were examples of chronic interstitial nephritis. There remained, however, 14 cases in which the nephritis was of either the subacute or the chronic parenchymatous variety. I doubt if this form of hæmorrhagic nephritis can be regarded as identical with that described as occurring in children by Dr. Wyllie and Dr. Moncrieff, in spite of many points of similarity between their cases and those which I have seen. Apart from the age-incidence, there are other differences. Thus, I can find nothing in the latter series of cases to suggest any infective or septic ætiological factor such as is suggested by your contributors. It is, perhaps, merely a coincidence that the case in my series which most closely resembled theirs in its earlier stages was the only one which proved fatal. This patient was a boy, aged 8 years, whose first symptom was profuse hæmaturia, and who had blood in his urine almost continuously till his death from uræmia a year and a half later.

Dr. Wyllie and Dr. Moncrieff make reference to the possibility of there being quantitative alterations in the blood proteins in such cases. It may interest them to have the following data in this connexion. From the results of such estimations in seven samples of plasma from four of my cases (using Wu's method) I found: Total proteins, maximum = 8·500 per cent.; minimum = 4·808 per cent.; mean = 6·431 per cent. Albumin, maximum = 4·946 per cent.; minimum = 2·720 per cent.; mean = 4·031 per cent. Globulin, maximum = 3·377 per cent.; minimum = 0·170 per cent.; mean = 2·080 per cent. Fibrinogen, maximum = 0·385 per cent.; minimum = 0·187 per cent.; mean = 0·293 per cent. I do not wish to comment upon these results further than to say that while the mean values indicate a slight relative decrease of albumin and a slight relative increase of the globulin fraction (as judged by the normal cases recorded by Wu (1922)), my experience of such estimations of the plasma proteins is that the results show ranges of variation, even in normal cases, so great that it is unwise to attempt to draw conclusions from the examination of small series of cases. With regard to the other chemical features of these cases of hæmorrhagic nephritis it may be said briefly that there was in *most* patients no indication of gross nitrogen retention—the blood-urea and non-protein nitrogen being normal or only slightly above normal, and the response to the urea-concentration test being usually satisfactory.

So far I have not been able to find any adequate explanation of the mechanism by which the bleeding is produced in this form of nephritis, but I feel as sure as one can be without histological evidence that the bleeding is not due to congestion alone. One is tempted to try to find analogies between this form of nephritis and such hæmorrhagic conditions as the purpuras, but I have never found any gross reduction in the number of blood platelets such as occurs in the latter.—I am, Sir, yours faithfully,

J. N. CRUICKSHANK, M.D., F.R.F.P.S. Glasg., M.R.C.P. Lond.,
First Assistant to the Muirhead Professor of Medicine Glasgow University; Director, Research Department, Glasgow Royal Maternity and Women's Hospital.

Jan. 16th, 1926.

INTRA-URETHRAL NEGATIVE PRESSURE DURING COITUS.

To the Editor of THE LANCET.

SIR,—An argument is occasionally put forward by those who are sceptical regarding the efficacy of immediate self-disinfection as a means of preventing gonorrhœa, to the effect that during the act of coitus a suction action is produced whereby infective matter is carried down the male urethra beyond the reach of disinfectants applied with a swab or sponge. I am unable to trace this argument as having been brought forward by any witness before the Committee of Inquiry, presided over by Lord Trevethin, although it is recorded in the report, published in 1921, of the Venereal Disease Committee organised by the National Birth-Rate Commission. On page 3, Part II., of this report, Mr. Charles Gibbs, F.R.C.S., is reported to have said:—

> "One can understand that in large military areas where you have excellent doctors who are drilling and teaching the men how to use it (the prophylactic packet) one can understand that after some time one would get good results; but for the ordinary public to say 'get up in a corner and wash the penis in permanganate of potash' is useless. The danger time is the time of intercourse. The shape of the male organ is such that the orifice of the glans penis opens in the introducing movement and closes in the withdrawing action *thus sucking infection into the urethra* [my italics], and I do not think it will have any effect to apply disinfectant on the outside in many cases."

No one will deny Mr. Gibbs's statement that the meatus "opens in the introducing movement and closes in the withdrawing action," but his deduction "thus sucking infection into the urethra" cannot be so easily accepted. On the contrary, I believe that the closure of the meatus during the withdrawal action prevents the possibility of suction of vaginal fluids into the male urethra, the lips of the meatus acting as a valve and closing *immediately* the withdrawal action commences, and acting as a valve closing the more firmly the more vigorous the withdrawing action.

It is possible that a negative pressure or suction action may be produced in the *vagina* on every withdrawal stroke, the vagina being the cylinder and the penis the piston, but such suction action in the vagina would tend to *prevent* the entrance of infective matter

into the male urethra rather than to encourage it. If Mr. Gibbs's suction theory was based on an erroneous interpretation of the mechanical processes taking place in the penis and vagina during coitus, then it necessarily follows that all argument founded on such false premises falls to the ground.

I am, Sir, yours faithfully,

Jan. 18th, 1926. H. WANSEY BAYLY.

*** We need more material on which to base opinions as to the value of prophylaxis, especially as to how quickly organisms placed on the meatus spread up the urethra.—ED. L.

THE TREATMENT OF HUMAN ANTHRAX.

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 9th Dr. A. Pijper, of Pretoria, warmly recommends the salvarsan treatment of human anthrax. Some years ago a man with 12–15 sores distributed over the body came to me for treatment. Smears were taken from several vesicles and the anthrax bacillus was found in each. The sores were frozen with ethyl chloride, the centres scooped out and touched with carbolic acid, and 1/100 sol. carbolic acid injected into the surrounding tissues. The sores varied from some with blackened centre and œdema of tissue to small hard lumps almost cartilaginous when cut out. The patient made a good and painless recovery. Three weeks before he had buried a cow that died of an unknown disease. This case helped to show that cutaneous anthrax can be controlled in various ways, and I wonder if there is any record of pulmonary anthrax having been successfully treated by neosalvarsan.

I am, Sir, yours faithfully,

Cowes, Isle of Wight, Jan. 17th, 1926. L. P. GIBSON.

INSTRUMENTAL MIDWIFERY.

To the Editor of THE LANCET.

SIR,—Many years ago I was summoned to appear before the Master of Rotunda to explain why, when attending confinements outside the hospital, I never took to the case a midwifery bag. The reply was that "I did not think it was necessary." Next, I was asked to explain in detail how I conducted an ordinary confinement? The answer was, "I inquire when the labour commenced; count the woman's pulse, note the character of the pains, disinfect my hands in a strong solution of biniodide of mercury, palpate the abdomen, examine over the sacrum for œdema, and listen to the fœtal heart. Here is what I use in lieu of a midwifery bag," and produced from my waistcoat pocket a large pill-box containing biniodide of mercury tabloids. "My cases never show pyrexia during the puerperium, as I seldom find it necessary to examine P.V." The Master handed me a short list of articles to take to every confinement that in future I attended.

On my way back to the residents' quarters I met a doctor from the State of Illinois to whom I told my troubles, that I was on duty that day and could not comply with the Master's orders. He kindly offered to lend me the few articles which appeared on the Master's list and took me to his cubicle for this purpose. His instruments were truly wonderful; he seemed to possess everything that any surgeon could want under any circumstances. Leaving him, uneasy in my mind, I was guilty of a discourteous act for which I have ever since been secretly ashamed—I went and examined the out-patients' case-book and found that *nearly all his patients were running temperatures.* Since those days, like many others, I have spent very many sleepless nights—waiting for infants to be born naturally. The counterfoils of my death certificate book are still without a maternal blemish. I believe this result has been accomplished on the idealistic lines expressed by Prof. Ranken Lyle at the meeting of the Edinburgh Obstetrical Society reported in your last issue. I am convinced that careful antenatal care with induction in certain cases when the child is viable will meet many cases which, allowed to drift, lead to Cæsarean section or craniotomy.

Someday midwifery forceps may be of historical interest only. Prof. Lyle's idealism is easier to attain than casual observation might lead one to believe. It certainly should not be possible to quote statistics embodying thousands of cases of craniotomy and Cæsarean section. Suppose for one instant that on opening your morning newspaper it announced the number of infants delivered by forceps in the British Isles in the preceding 24 hours! Are forceps *really* necessary as frequently as they are used? The fact that patients arrive in labour at term at the maternity hospitals requiring urgent operations is irrefutable evidence that someone or other has failed to live up to Prof. Lyle's idealism. I do not know Prof. Lyle, but I think that he will agree with me that the way to reduce maternal mortality is to have a coroner's inquest on every woman who dies in childbirth and let the death be attributed to misadventure, make conception notifiable early, and let the principal work of the maternity hospital be the care of the expectant mother.—I am, Sir, yours faithfully,

J. HARGREAVES ROBINSON.

Harley-street, W., Jan. 18th, 1926.

PROFESSIONAL CRITICISM OF THE GENERAL MEDICAL COUNCIL.

To the Editor of THE LANCET.

SIR,—I am sorry to have misread Dr. Gordon Ward's meaning, and apologise to him for having done so. I am not sorry, however, that I wrote my previous letter, because as I misread Dr. Ward's meaning it is almost certain that others have done the same. The matter is of some importance, as I fear that there are officials of approved societies, and even members of insurance committees, who believe that doctors are capable of doing such things. Now there is need of amendment of the certification rules under the National Insurance Act and also of improvement in the ways in which these rules are interpreted and carried out by certain officials of some societies. It is difficult to say which of these is the greater need, but it is certain that the advance must come by mutual agreement between the officials of the societies who have to make payments under the Act, and the doctors who advise them, an end to which we are not likely to attain if there is any suspicion of one side by the other.—I am, Sir, yours faithfully,

Welbeck-street, W., Jan. 12th, 1926. T. B. LAYTON.

GLYCOSURIA AND LIFE ASSURANCE.

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 9th you comment on the attitude of life insurance companies towards clients whose urine is found to contain a copper-reducing substance, and suggest that they are not quite fairly dealt with. May I point out that you do not take into consideration the following important matters—namely, that owing to the apparent dislike of a section of the public to undergo medical examination—hence the growing popularity of the non-medical schemes—the applicant, if medically examined and found to be glycosuric, is often not prepared or willing to incur the expense or time involved in having his blood-sugar curve taken. It is surely no part of the duty of the company, even if the applicant is willing, to spend time and incur expense in conducting such investigation. In three cases lately examined where such investigation was carried out by the applicants, the blood-sugar indicated in one the probability of diabetes and in the other the practical certainty of it. Yet these cases might otherwise have been easily passed as ordinary risks under the non-medical schemes as everything else appeared normal.

I am, Sir, yours faithfully,

ARTHUR T. DAVIES, M.D., F.R.C.P.

Tokenhouse Yard, London, E.C., Jan. 11th, 1926.

THE TWORT-D'HERELLE PHENOMENON.

To the Editor of THE LANCET.

SIR,—We should like to offer a few remarks on the so-called action of transmissible bacterial lysin on dead bacteria. In a recent number of THE LANCET [1] F. W. Twort reports the following experiment:—

"A new strain of the lysable white micrococcus and fresh active lysin were obtained from vaccinia. The micrococcus was isolated free from lysin, and grown on agar slopes for 24 hours; from these a moderately turbid emulsion was made with normal saline. The emulsion was heated in a water-bath at 60° C. for one hour, then mixed with an equal quantity of ordinary sterile peptone-beef broth, and 2 c.cm. of the mixture pipetted into each of four sterile test-tubes. Tube 1 received no addition. Tube 2 was inoculated with a loopful of pure living micrococcus. Tube 3 was inoculated with two drops of filtered lysin. Tube 4 was inoculated with two drops of filtered lysin and a loopful of the living micrococcus. This experiment throughout the paper will be referred to as the standard experiment. The four tubes were incubated at 37° C. After 24 hours tubes 1 and 3 showed no visible change. Tube 2 showed an increase of turbidity, while tube 4 showed a marked clearing of the emulsion."

From these facts Twort infers that there is lysis of dead bacteria when the lytic agent is being freshly produced in the presence of living bacteria of the same variety. About two years ago we performed, with the same results, experiments entirely identical, and for a while we had the same opinion as Twort has since expressed. But a more complete analysis of the phenomenon afforded a quite different interpretation, as will be seen. Although our results have already been briefly reported,[2] it will be of interest to recall here the circumstances that led us to our investigations and to our conclusions. When to a tube of broth seeded with staphylococci an extremely small amount of filtered lysin is added, the growth is not inhibited and an apparently normal culture is obtained. A few days later, however, when there is no longer growth and the bacteria are at rest, or perhaps already degenerating, the culture gradually becomes completely clear. It is therefore evident that, contrary to the usual observations on the transmissible lysis of other bacteria—e.g., the colon bacillus—a bacterial lysis occurs, in this case in conditions where bacteria do not grow. We therefore hoped that in this particular instance we could perhaps obtain the lysis of dead micrococci as well.

Experiment.—From a 24-hour agar slant culture of staphylococci a suspension was made and thoroughly washed. Heated for one hour at 62° C., the suspension was then diluted in sterile broth until the opacity was equal to that of a broth culture of staphylococci, and then divided in a few sterile test-tubes, half of these tubes receiving no addition while to the others was added two drops of filtered lysin. After a week at room temperature the turbidity of the first tubes remained unchanged, while the second set of tubes showed a partial but quite striking clarification.

In this experiment, then, dead staphylococci were partially dissolved by the filtered lysin. The result was clear-cut, and because of its significance we reported it at once in a preliminary note at the Société de Biologie. We very soon regretted our haste. When repeating these experiments later on we obtained very irregular results. Sometimes mixtures of dead micrococci with filtered lysin showed a marked clarification, while in many other instances not the slightest clearing could be noted, even after several weeks. By plating these mixtures we were then aware that the unchanged mixtures were always perfectly sterile, while the clarified ones contained a few living staphylococci that had been introduced into the mixture either with an insufficiently heated suspension or with a filtered lysin which had been passed through an unsatisfactory filter. Accordingly, the following experiments were performed with carefully controlled suspensions of dead staphylococci and carefully controlled filtered lysin.

Experiments.—The broth suspension of dead staphylococci was pipetted into each of four sterile test-tubes. Tube 1 received two drops of sterile broth. Tube 2 received one drop of sterile broth and one drop of living culture of staphylococci. Tube 3 received one drop of sterile broth and one drop of filtered lysin. Tube 4 received one drop of filtered lysin and one drop of living culture of staphylococci. After three days in the incubator at 37° C. tubes 1, 2 and 3 remained turbid, tube 2 being sometimes even more turbid than the others; tube 4 showed a striking, although incomplete, clearing.

The filtered lysin alone is thus unable to dissolve dead bacteria, but when associated with living bacteria it brings about a marked clarification. Control experiments proved that such a result could only be obtained with bacteria of the same species. Experiments and conclusions were exactly the same as those recently reported by Twort. Our next step, however, taught us that our interpretation was erroneous.

Experiment.—The preceding or standard experiment was repeated in exactly the same way, except that instead of using broth suspensions of bacteria we used saline suspensions. After three days' incubation at 37° C. tubes 1 and 3 were unchanged, but tube 2 this time was exactly as clear as tube 4.

Therefore, when the process happens in saline, it becomes evident that it is not the lysin that dissolves the dead bacilli, it is the living bacteria that are responsible for it. In fact, the same thing occurs in broth; the living bacteria introduced in tube 2 dissolve the dead bacteria in broth as well as in saline, but in broth they multiply actively and conceal by the opacity of their own growth the clearing of the dead suspension. The presence of lysin, perfectly meaningless when the experiment is done in saline, plays merely a secondary rôle when in broth by preventing the growth of the living bacteria to mask the clarification they brought about.

That such is the real meaning of the preceding experiments would be thoroughly proved if we could obtain the same result in broth as in saline by preventing the growth of living bacteria by some other means. This was realised as follows: Since Jaumain's experiments [3] it is known that in sealed tubes—i.e., in confined areas—staphylococci do not grow.

Experiment.—In a gas flame, a stricture was made in the middle of four sterile test-tubes. The bottoms of these tubes were filled with broth suspension of dead staphylococci up to the stricture and then convenient amounts of filtered lysin and living bacteria were added according to the standard experiment. Immediately after the stricture was closed in the flame and the sealed tubes were incubated at 37° C. for three days. Tubes 1 and 3 remained turbid; tubes 2 and 4 were clear.

Exactly as in the saline experiment, the living bacteria in tube 2 dissolved the dead emulsion as well as in tube 4, but as they were unable to grow in the sealed tubes the clearing remained visible. If we now open the tube 2 and pipette aseptically the clarified mixture into an ordinary test-tube, after a few hours growth at 37° C., the living bacteria have multipled and, as in the standard experiment, mask the clearing of the dead organisms. Living bacteria alone dissolve the dead ones; the presence of the lysin in broth suspensions is necessary to prevent the growth of the living cocci which mask the clearing of the dead suspension, and is superfluous when the experiment is done in saline or in sealed tubes.

In further experiments we were able to demonstrate the dissolution of the dead cocci by the living ones not only in liquid suspensions but also on solid media. The temperature at which the bacteria were killed is indifferent. It is a nutrition phenomenon; the living bacteria multiply to some extent while the dead cocci are reduced to minute Gram-negative granules. It affords not only the real interpretation of the standard experiment but also an explanation of Jaumain's phenomenon—i.e., the spontaneous clearing of broth cultures of staphylococci in sealed tubes. It is easy to show that in a confined area most of the cocci very quickly die, while the few that remain alive dissolve the dead cocci. This mechanism of auto or isophagy is available also for the ordinary autolysis

of bacteria. It is one of the aspects of the necessary destruction of dead bacteria on the earth, this being also realised to a great extent in nature by heterophagy. One of us, with Sara Dath,[4] has recently studied the remarkable lytic action that different micro-organisms, and especially mould-like streptothrix, exert on a great number of bacteria; a phenomenon which was also studied independently by R. Lieske.[5]

We conclude, therefore, that the dissolution of dead cocci observed in the recent experiments of Twort and in our former experiments, apparently due to the lytic agent, is, in fact, produced by the living cocci, the rôle of the lysin being only of a secondary importance by preventing the growth of the living bacteria from concealing the clearing they had brought about. Up to the present time no evidence has been brought forward to indicate that the transmissible bacterial lysin or bacteriophage is able to dissolve dead bacteria. It is of importance because the dissolution of dead bacteria by the transmissible lysin would be a most significant fact for the understanding of the Twort-d'Herelle phenomenon.

We are, Sir, yours faithfully,

ANDRÉ GRATIA.
BERNICE RHODES.

Pasteur Institute, Brussels, Jan. 14th, 1926.

Bibliography.—1. THE LANCET, 1925, ii., 642. 2. Compt. Rend. Soc. de Biol., 1923, lxxxix., 1171; 1924, xc., 640. 3. Ibid., 1922, lxxxvii., 790. 4. Gratia, A., and Dath, S.: Ibid., 1924, xci., 1443; 1925, xcii., 461, 1129; 1925, xciii., 451. 5. Morphologie und Biologie der Strahlenpilze, Leipzig, 1921, p. 141.

MEDICAL SERVICES TO INDUSTRIAL FIRMS.

To the Editor of THE LANCET.

SIR,—May we bring to the notice of all medical practitioners specially interested in industrial medicine the recent formation of an association of British industrial physicians and surgeons under the title of the "Council of Industrial Medicine." This body commenced its existence a year ago as the British Section of the International Medical Congress on Industrial Accidents and Diseases, which held its fourth meeting at Amsterdam in September last, and it has now been incorporated in the Federation of Medical and Allied Services. Its objects are to promote the study of this important branch of preventive medicine; to enable practitioners thus engaged to meet and discuss common problems; and to provide a source of information on industrial health questions. Already the medical officers of a number of the leading industrial firms in London and the provinces have joined the Council, but it is known that there are many practitioners similarly engaged whose names cannot readily be ascertained. To all such full particulars will gladly be sent on receipt of a postcard addressed to the Secretary, Council of Industrial Medicine, Federation of Medical and Allied Services, 12, Stratford-place, London, W. 1.

We are, Sir, yours faithfully,

D. A. COLES, Chairman.
EDGAR L. COLLIS,
THOMAS OLIVER,
THEODORE THOMPSON, Vice-Chairmen.
N. HOWARD MUMMERY, Hon. Medical Director.
H. S. N. MENKO, Hon. Foreign Medical Secretary

Jan. 19th, 1926.

THE LATE DR. W. P. HILLIAM.—William Percy Hilliam, who died on Jan. 14th at his residence at Storr Hill, Bradford, Yorks, studied at the Sheffield School of Medicine, at Edinburgh, and at St. Thomas's Hospital, London, qualifying L.S.A. in 1893. He was an ardent and accomplished horseman, a keen sportsman, and an assiduous follower of the Fitzwilliam hounds. It is recorded that in 1884, when he was out with the hounds, his horse took fright, and in bolting cleared a wagon and four horses, making a distance of 38 feet from taking off to landing. Dr. Hilliam leaves a widow and one son. Brigadier-General Edward Hilliam, who served with the Canadian Contingent, is his younger brother.

Obituary.

GEORGE HERBERT HUNT, M.D. OXF., F.R.C.P. LOND.

THE death, at the early age of 41, of Dr. G. H. Hunt, physician to Guy's Hospital, which occurred on Jan. 9th, has already been announced in THE LANCET.

George Herbert Hunt was educated at Rugby School and was in Mr. Whitelaw's House. He went up to Christ Church, Oxford, where he began to study medicine, taking second-class honours in the Final Honour School of Physiology in 1906. It was at Oxford that he carried out his first piece of research, namely, the testing of the nitrogen excretion in the urine of a perfectly healthy man immediately after the excision of one kidney, an operation necessitated by an accident at football; it was concluded that the other kidney at once took up adequately the complete excretory function. This was long before the days of blood-urea estimations, so that any temporary retention could not be tested. This, as so much else of Hunt's research work, was carried out in collaboration with others, making it not always easy to separate out his particular contribution. He was an absolutely unselfish worker, taking endless pains to do his part of the work efficiently.

DR. G. H. HUNT.

Hunt entered Guy's Hospital in 1907, where he early developed an exceptionally keen clinical faculty. He held the appointments of clinical assistant, out-patient officer, and house physician, and was appointed medical registrar as soon as his time as house physician was completed. Two years later, in 1913, he was appointed assistant physician and he became full physician to the hospital as recently as last summer. In early days he was a little nervous about passing examinations, though he always sailed through with flying colours; in later life he lost this diffidence and became a first-rate physician and an excellent teacher. In 1914 Hunt served in the 1/2 London Casualty Clearing Station in France, in 1916 at the No. 25 General Hospital, B.E.F., in 1916–17 at the Royal Military Hospital, Devonport, in 1917 at the Royal Victoria Hospital, Netley, and in 1917–19 at Cambridge, where he worked in close coöperation with the R.E. Experimental Station, Porton. He was mentioned in despatches in 1915 and gained the rank of Brevet-Major, R.A.M.C.(T.). He was one of the earliest to describe the new disease now commonly called "trench fever," but his most important work was carried out at Cambridge in collaboration with Dr. J. Barcroft and others on the later effects of gas poisoning and the results of oxygen treatment. The conclusions may be summed up as follows: Gassed subjects develop a small degree of polycythæmia and there is delay in the length of time that it takes for the pulse to become normal after exercise. After treatment for five days in an oxygen chamber the pulse returns to its normal value more quickly, the polycythæmia disappears, and the patient's symptoms—e.g., the attacks of nocturnal dyspnœa, the præcordial pain—are much improved. While working at Cambridge he also described a method of measuring dyspnœa by calculating the total pulmonary ventilation during the second, third, fourth, and fifth minute after a given exercise was completed and dividing this number by the pulmonary ventilation during four minutes of rest previous to the exercise. This dyspnœa ratio was found to be the most constant

of the respiratory data obtained. The value increased as the exercise became more strenuous, was lower with untrained than with trained individuals, and still lower in the case of certain pathological cases and of men who had been gassed.

At the end of the war Hunt returned to Guy's Hospital, taking up again the clinical and teaching work that he had left in 1915. In particular he threw much of his energies into the organisation of the massage department. He had been appointed physician in charge when the department was opened in 1913, and was also lecturer in medicine to the massage students. He used to visit all the medical cases for which exercises and massage were prescribed by members of the staff, although later on he gave up the nervous cases. He was particularly interested in the curative effect of physical exercise and massage on the heart and lungs, and as a result of his experience in the department he formulated definite rules by which exercises were graduated as regards their severity. It is fortunate that this work was published in the *Guy's Hospital Reports* of last year. For this purpose he divided heart cases into three groups: (1) cases which had recently suffered from acute carditis; (2) cases with signs of cardiac failure; (3) cases with effort syndrome. Exercises of gradually increasing difficulty were ordered, but the rate of increase was slowest in the first groups and most rapid in the last group. The masseuse was instructed to look for a rise in pulse-rate as the criterion as to whether the exercise was too hard or not. Closely related to this work is a paper, also in the *Reports*, dealing with the "pulse-ratio"—i.e., the ratio of the number of heart-beats, counted during the first two minutes after exercise, to the resting value for one minute. This method was introduced, as he found that the more usual clinical method of determining cardiac efficiency—viz., measuring the length of time it takes for the pulse to return to the resting value—led to uncertain results. The exercise chosen for the test is of the simplest kind—stepping on and off a block, 13 inches high, for three minutes. The number of steps per minute for a particular case is chosen, so that a pulse-ratio near to the value 2·5 is obtained. Knowing the number of steps that produces this value in the healthy trained individual (and calling it 100) it is possible to get an expression for the percentage efficiency of the individual in question. A further paper in the *Reports* on the exercises used in pulmonary cases must be read in the original, as a considerable variety of methods are used in cases of non-expansion of the lung after empyema, in pleurisy, and in the evacuation of bronchiectatic cavities. His work on physical exercises at Guy's Hospital led him to take a keen interest in the Chartered Society of Massage and Medical Gymnastics, of which he became a member of council in 1925, and for the last few years he lectured to its members. In 1923 he gave a special course of lectures on the treatment of heart disease to the Teachers' Association of the Chartered Society. In 1924 he contributed to the Modern Technique in Treatment series in THE LANCET an article on the Treatment of Functional Disorders of the Heart, which was widely appreciated.

At Guy's Hospital Hunt continued, as far as his health would permit him, the work he had begun at Cambridge. He was honorary secretary of the Clinical Uses of Oxygen Committee of the Medical Research Council. At the time of his death he had begun what would have developed into a very successful private practice, dealing specially with diseases of the chest, and, in particular, heart disease, and he published a number of clinical studies on this subject from time to time.

Dr. E. P. Poulton, to whom we owe much of this biographical sketch, adds: "No account of Hunt's life would be complete without an indication of his love of music which was associated with a considerable musical ability. He came from a musical family, and was a skilled viola player; his playing was much appreciated at Rugby, Oxford, and Guy's. He was greatly in demand at the hospital Christmas festivities in his younger days, while in later life he was a regular player in quartets. His music was the dominating interest of his life outside his work. He also sang tenor, and the present writer can testify to his power of singing difficult music at sight, both when he was a schoolboy in the choir at Rugby and later in the Oxford Bach choir. He well remembers Hunt's comical dismay at a senior Oxford don, enthusiastic but not always quite in tune, when the music was difficult. His music made him a combination of artist and physician. Golf and lawn tennis were his favourite games and at both of them he was a player of more than average ability.

"Perhaps his friends will chiefly remember him for his gentle and sympathetic personality. His musical temperament, his profession as a physician, and the fact that as a boy he was brought up among sisters, without a brother of his own, may all have been factors which helped to form a very lovable nature."

In 1915 Dr. Hunt married Miss Rosie Strauss, who survives him. His colleagues at Guy's and his many professional and private friends have sustained a great loss by his early death and will extend their deep sympathy to his widow, to his two little girls, and to his sisters in their bereavement.

JOHN BASIL HALL, M.B., M.CH.CAMB., F.R.C.S. EDIN. & ENG., J.P.

BY the sudden death on Jan. 12th of Mr. Basil Hall at the age of 60 years, Bradford has lost something more than its principal surgeon, for Mr. Hall was a big influence in civic and professional life in the West Riding.

John Basil Hall was son of the late Dr. William Hall of Headingly, whose name is cherished in Leeds as a friend of necessitous school-children. Both his grandfathers were also in medical practice in Yorkshire. He was educated at King's School, Canterbury, and Pembroke College, Cambridge, going on to St. Thomas's Hospital, London, for his clinical studies, which he completed in 1892. After holding a series of resident appointments at the Leeds General Infirmary and some post-graduate study in Vienna, he settled in Bradford with the intention of limiting himself to surgical work; having obtained the F.R.C.S. Edin. in 1899 he soon became honorary surgeon to the Bradford Royal Infirmary, a position which he held for the statutory 20 years.

As a surgeon Mr. Hall's interests were wide. A densely populated manufacturing district affords surgical material of many kinds and his published clinical notes, all brief and to the point, are very various. His surgical colleagues at the infirmary speak of his work there as neat and dexterous, for he was by nature clever with his fingers; but they emphasise also the broad common-sense view which he took of his cases and the value to the institution of his orderly mind and retentive memory. He was himself watchful lest mere technique should cramp the development of surgical judgment, and he was apt to quote with approval the remark of Sir William Macewen that no one can become a good surgeon unless he is first a good physician. During the second and third years of the war Mr. Hall had a period of service in the Dardanelles with the Mediterranean forces, which he greatly valued in its personal and human aspect, although he returned with no illusion as to the value of military experience in dealing with sickness in civil life. As chairman of the building committee he was enthusiastic in his efforts to found a hospital in Bradford commensurate with the needs of the town and was instrumental in securing the new site on Daisy Hill on which, had it not been for the intervention of the war, the new infirmary would now be standing. At different times he presided over the Bradford and the Leeds Medico-Chirurgical Societies and he had been for long President of the Bradford Division of the British Medical Association, when, as a crown to his labours, he became President of the Association at its annual meeting in Bradford in 1924.

During his year of office the leisured mind and practical judgment which he brought with him ensured respectful hearing on deliberative occasions, and it fell to his lot to visit Canada to address the Ontario Medical Association and to represent the British Medical Association at the Atlantic City meeting of the American Medical Association. While still President, the Royal College of Surgeons of England conferred upon him the honorary Fellowship of the College.

Several years ago Mr. Hall became a justice of the peace for the city of Bradford. His favourite hobbies were fishing and motoring. In 1898 he married Lisbeth, daughter of Mr. Thomas Mackenzie, of Achnaaird, and he is survived by his widow and daughter.

WILLIAM JOHN NAISMITH, D.S.O., M.D., F.R.C.S. EDIN.

Dr. W. J. Naismith, who has died at St. Andrews at the age of 78, was the son of the late Dr. J. Naismith, deputy surgeon-general at Agra. He was born in India and at the age of 10 was sent to England to escape the Mutiny. Qualifying at Edinburgh in 1869 he settled in Ayr, where he became the first surgeon of the Ayr County Hospital, and where he held many public appointments. It was as an officer of the Ayrshire Yeomanry that he saw active service in the Boer War, for which he was mentioned in despatches and received the D.S.O. Dr. Naismith was a skilful and self-reliant surgeon. He was closely identified with public health work for his town and with training in ambulance work in early days. He was an enthusiast for athletics and was perhaps at his happiest when presiding over the smoking concerts organised after the Ayr annual sports and the Academy sports. At the time of his retirement in 1908 he received a warm tribute from the townsmen of Ayr, who had learned to appreciate his cheerful, debonair manners and his goodness of heart. Dr. Naismith was twice married and is survived by his widow and by one son and two daughters.

EDWARD GRANVILLE BROWNE, M.B. CAMB., F.R.C.P. LOND.

Prof. E. G. Browne, who died at Cambridge on Jan. 5th at the age of 63, was one of the most eminent of oriental scholars. He was educated at Glenalmond, Eton, Cambridge, and St. Bartholomew's Hospital, and although he never practised medicine, graduated as M.B. at Cambridge in 1887 and later became F.R.C.P. under a regulation which permits practitioners other than Members of the College to be elected on account of their distinction. In the year of qualification he received a Fellowship at Pembroke College, Cambridge, and soon afterwards became lecturer in Persian in the University, succeeding Charles Rieu as Sir Thomas Adams's professor of Arabic in 1902. Much travel and a phenomenal memory made him familiar with many Eastern peoples, and he was devoted to the study of oriental literature, history, and religion. Unlike many scholars, however, he was able to combine his scholarship with a real understanding of the living language and the living mentality of the races he studied. Nor was his original profession forgotten. His FitzPatrick lectures to the Royal College of Physicians were on Arabian Medicine, and he produced other work on the same subject. As a teacher he was regarded with the affection and respect which his high scholarship, his wisdom, and his disposition demanded.

THE LATE DR. GEORGE CHAPMAN.—By the death of George Chapman, at his house at Hall Green, Birmingham, the medical profession in Great Britain loses its oldest member. He was a student at Queen's College, Birmingham, and qualified M.R.C.S. in 1866 and L.S.A. in 1868. Dr. Chapman had reached the age of 102 years. He retired from practice at the age of 80, and remained in good health, taking walks in the open air until the day before his death.

THE EXCRETION OF ALCOHOL IN URINE AS A GUIDE TO ALCOHOLIC INTOXICATION.

AT a meeting of the Medico-Legal Society held on Jan. 19th, with Sir William Willcox, Vice-President, in the chair, Dr. Godfrey Carter read a paper with the above title. He said that there was no subject in which medical evidence was more unsatisfactory than that appertaining to drunkenness, the evidences of which were very hard to reduce to a form that could be stated and still more to a formula that could be given to a bench of magistrates. Yet the recognition of the condition presented few difficulties at the time. Every member of a social group could say when a member of that group ceased to be normal; the general impression was made up of a number of small changes which could be sensed and analysed. But when, for legal purposes, it became necessary to apply a series of tests, such as poise, gait, ability to toe the line, smell of the breath, memory for recent and remote events, &c., it was universally agreed that the present tests were inadequate. No two men behaved exactly alike under the influence of alcohol. In consequence, many accused cases were wrongly dismissed, after serious motor accidents, for want of evidence sufficient to convict.

Present Tests.

In the speaker's opinion too much was made of the smell of the breath. It did not increase pari passu with the amount of alcohol taken, but only indicated that some alcohol had been consumed. It had no positive value, but was important as negative evidence. There were five tests to which he attached importance—viz., flushed face, sweating, dilated pupils, congested eyes, and rapid pulse. These were present in nearly all cases. The problem set to the practitioner was, as Taylor put it, to determine whether "the person's mental condition which led to the proceedings and caused him to behave in the manner he did prior to arrest was due to alcohol." If so he was drunk. The police surgeon usually heard nothing of the many cases of drunkenness settled daily in the courts, but recently he had come into prominence through a number of more serious cases, those of drunkenness in charge of a motor-car. There had often been serious injuries and damage to property and the accused might be a person of social standing, who realised the gravity of the charge and met it with indignant denials. The time factor was of great moment; nothing sobered a man more quickly than finding himself in prison for a serious charge. His power of regaining control under such circumstances was striking and he would often pass the usual tests quite satisfactorily or fail in one only, ascribing any weakness to the shock of the collision and his anger at being wrongly accused.

The New Test.

When the speaker heard of Dr. Southgate's test he began to see daylight. It appeared certain that there was a concentration of alcohol in the urine which indicated very strongly that the individual would be unfit to be in charge of a car. The defence of having taken a small quantity only could not be proffered; what was found in the urine must have gone in by the mouth. He arranged for a record of appearance and behaviour to be kept in the police books for comparison with the tests and for the samples to be bottled quickly to avoid evaporation. An initial difficulty was found in obtaining samples, as the accused men could not be persuaded to micturate to order; this was overcome by leaving them in a cell with a urinal leading to a receiver in the next cell. The great value of the test would be in borderland cases where the symptoms were only moderate and the defence alleged that so little alcohol had been taken that the conduct could not be ascribed to its influence.

Dr. H. W. Southgate said that the test was the outcome of four years' research in human subjects on the alcohol concentration in blood and urine. He showed a number of slides illustrating five points: (1) the general shape of the blood-alcohol concentration curve compared with that of glucose; (2) the factors affecting the height of the alcohol curve; (3) that the concentration in the blood was proportional to the toxic effect produced; (4) that the concentration of alcohol in the urine was closely related to that in the blood and that one could be deduced from the other; and (5) examples of the tests used and demonstration of how their usefulness could be applied. The samples were taken from a vein and the alcohol estimated and calculated on a percentage basis in the usual way and expressed as milligrammes of alcohol in 100 g. of blood. The concentration curve of blood-alcohol rose very rapidly—in about an hour—to its maximum and slowly came down, taking about 12 hours to return to normal, which was probably zero. The rate of disappearance was practically a straight line, and this held for wide range of concentration and all the individuals tested, and could therefore be safely used as the basis of tests. The glucose curve rose with equal rapidity, but fell within about one and a half hours to the normal of about 80 mg. to 100 g. The kidney could keep back glucose until it reached quite a high blood percentage, but had not this power for alcohol, and even half a glass of beer caused alcohol excretion. The actual maximum concentration varied with the dose. When alcohol was taken with food the concentration rose more slowly and never reached such a high maximum as when the dose was taken on an empty stomach. Some of the alcohol was held between the interstices of the food, but not enough to account for the difference, and what became of it was not known. The descending curves of concentration with and without food were parallel when the subject took exercise as well as when he rested. The tolerance of individuals varied very much according to their habits. The speaker showed a test taken by Dr. Schweisheimer in 1913, which compared the concentration figures of four subjects, one of whom was an abstainer, one a moderate drinker, and two heavy drinkers. The abstainer showed a high concentration; the chronic drinkers relatively low ones, as the alcohol never "got going" in their blood. Nevertheless, the factor of personal idiosyncrasy was very great, and it was impossible to be certain from the percentage in the urine how much alcohol had been taken.

Gréhant was the first to show that the concentration of alcohol in the blood was the measure of its toxic effect. When the body's maximum was reached the curve turned over and ran flat for a while (Gréhant's plateau). The subject was then dead drunk, and the alcohol escaped by any pore it could find. There was no difference in practice between the toxicity of a rising and a falling concentration measured on the same level. Comparison of the relative effects of whisky and stout, containing an identical amount of alcohol, showed that the concentration with whisky reached a higher maximum much more quickly than with stout, had a greater effect on the subject, and passed off more quickly. This was because the stout took much longer to drink. Toxicity was measured by the subject's ability to draw a square with its diagonals inside a circle. Miles showed that the concentration in the urine passed that of the blood almost at once and maintained a fairly constant relationship with it (1·35–1·45) whatever food is taken and whatever urine is passed. This point was important, as the evidential value of the test depended on it. One slide showed the concentration in the urine of four motorists arrested for drunkenness. One case, who had 257 mg. 15 minutes after arrest, was 40 minutes later pronounced fit by the police surgeon and released. A sample of urine taken some time after arrest would naturally not give the concentration at the time of arrest. He proposed, therefore, that this should be calculated in a standardised test by taking another sample at a measured time afterwards and plotting the concentration at arrest on the resulting curve, the time between arrest and the taking of the first sample being known. He pleaded that any standard submitted should be based on behaviour tests made with individuals of varying tolerance, each of whom had a dose that would make his concentration the same as that of the others. This test would show what the average concentration was, beyond which a person was not fit to be in charge of a car. Dr. Southgate then described the methods by which the alcohol content was estimated.

Discussion.

Dr. Mackenzie Wallis said that he could confirm Dr. Southgate's findings from his own work on blood-alcohol concentration in hospital cases, mostly intoxication. Cases of alcoholic poisoning, especially those being treated by gradual reduction of alcohol, often showed albuminuria, and this he thought of importance. Every case differed in regard to his tolerance for alcohol. Another factor that must be considered was the time of day and the question of fatigue; there was much less tolerance to alcohol in the morning than later in the day. Experiments should be made as to the effects of the same dose of alcohol after a heavy meal of varying dietaries.

Dr. Roche Lynch asked whether evidence obtained by such a stratagem as Dr. Carter described would be admissible in a court of law; whether Dr. Southgate had investigated the relation of the alcohol concentration to other diseases such as nephritis and to abnormalities in the basal metabolic rate; and whether it was possible to judge from an analysis done some hours later the height to which the alcohol curve had risen at its maximum. He understood that the absorption of alcohol after a meal containing a lot of fat was much slower than after proteins and carbohydrates. Apparently the maximum concentration was much the same in chronic drunkards and in total abstainers, yet with the same dose the former might show no evidence of drunkenness while the latter showed marked signs.

Dr. Morgan Finucane pointed out that the pamphlet issued by the Board of Control ("Alcohol: Its Action on the Human Organism") stated that very little or no alcohol was excreted in the urine. There was no public demand for boiling down drunkenness to a test, and it could not be done. It was far better to rely on the experience and common sense of the police and the observers of the conduct of the accused. He did not agree that the odour of the breath was insignificant or that sweating was a valuable sign, and regarded Dr. Carter's other four signs as trivial.

Mr. Ernest Williams said that the test would certainly be admissible as evidence.

Dr. A. S. Woodwark asked how it was possible for a man to be sober an hour after arrest, as Dr. Carter said, when the alcohol concentration curve fell steadily. He felt that no definite pronouncement could be made until many more experiments had been performed on the alcohol concentration in relation to various types of food. The same amount of sugar in the blood might produce very different effects in two different cases; alcohol might vary in the same way, and the blood-alcohol not give sufficient evidence as to the capacity of the individual for managing a vehicle.

Sir Bernard Spilsbury said that a fallacy might arise through the varying amount of urine contained in the bladder before the alcohol was taken. It would almost certainly be impossible to get a second specimen from a drunken man. There was an immense amount still to be done, especially on the effect of such things as kidney disease on excretion of alcohol, before a test could be submitted for legal use.

Dr. B. A. Levinson pointed out that the refusal to submit to a test such as this would be strong evidence against the accused. In his opinion magistrates longed for some standard; he had seen most conflicting evidence brought forward by opposing doctors. The new test would be of extraordinary value in such cases, especially to rebut a defence claiming that no alcohol had been taken.

Dr. Carter, in reply, said that the matter was only in an experimental stage, but Dr. Southgate had definitely proved that alcohol was excreted in the urine.

Dr. Southgate, in reply, said he had only had one case of renal insufficiency and this showed a lowered value. The report of the Liquor Control Board referred to the total output which was quite different from the concentration. In his opinion no man with more than 150 mg. of alcohol per 100 c.cm. of urine was fit to be in charge of a car.

Medical News.

UNIVERSITY OF LONDON.—At the First Examination for medical degrees held in December last, 114 candidates satisfied the examiners, and the following were awarded a mark of distinction :—

Inorganic Chemistry.—Alan Ruscoe Clarke, Haileybury College; Marian Josephine Cunning, London (R.F.H.) School of Medicine for Women; and Philip Frankenberg, St. Bartholomew's Hospital.

Physics.—Eric Stuart Harverson, University College; and Moses Shorvon, King's College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a quarterly meeting of the Council of the College on Jan. 14th, Sir John Bland-Sutton, President, being in the chair, it was resolved that for the rest of January and during February the museum be kept open till 5 P.M. instead of being closed at 4 P.M.—A further application from Mr. F. W. Axham for restoration to the Membership of the College was considered, but the Council did not see fit to rescind the resolution of July 13th, 1911, removing Mr. Axham from being a Member of the College.—It was agreed that a gown for Licentiates in Dental Surgery of the College be instituted and that the following addition be made to Section XXVI. of the Regulations of the Council relating to Academical Costume :—

The gown for Licentiates in Dental Surgery shall be a black stuff gown similar in shape to the Fellows' and Members' gowns, with facings of crimson cord and with a sleeve looped with crimson cord.

—The President reported that Sir Berkeley Moynihan had consented to deliver the next Hunterian oration and accordingly declared him to be appointed Hunterian orator for 1927. The President also reported that he had appointed Sir John Lynn-Thomas as Bradshaw lecturer, and Prof. G. Elliot Smith as Thomas Vicary lecturer for the ensuing year.—A letter was read from Mr. Raymond Johnson resigning his membership of the Court of Examiners. The President stated that the vacancy on the Court of Examiners thus occasioned would be filled up at the ordinary Council on March 11th.

The diploma of F.R.C.S. was conferred upon Laurence Frederick O'Shaughnessy, who had previously passed the necessary examinations and had now complied with the by-laws. The diploma of M.R.C.S. was conferred upon S. A. Antoun, Birmingham; Hilda M. King, Royal Free and St. Mary's; and Nellie L. Pyman, Charing Cross Hospital.

Diplomas in Public Health were conferred (jointly with the Royal College of Physicians of London) on the following 16 candidates :—

P. L. T. Bennett, Margaret E. Bjorkegren, and M. A. B. Brito-Mutunayagam, Univ. Coll.; A. B. Davies, Guy's and King's Coll.; Sylvia V. Elman, Royal Inst. Public Health; W. D. Forgrave, Belfast and King's Coll.; Janet M. Gillison, Edinburgh and King's Coll.; A. W. Grace, Univ. Coll.; F. V. Jacques, Bristol and Univ. Coll.; C. R. Lane, Oxford and King's Coll.; J. H. Porter, Cambridge and Royal Inst. Public Health; W. O. Pou, Univ. Coll.; A. S. Sachdev, Punjab and Royal Inst. Public Health; J. Singh, Punjab and Univ. Coll.; B. K. Vardya, Bombay and Univ. Coll.; and H. C. M. Williams, St. Bart.'s.

Diplomas in Laryngology and Otology were conferred upon :—

P. V. Cherian, J. M. Damany, W. J. McNally, and N. C. Ramchandani.

Diplomas in Tropical Medicine and Hygiene were conferred upon :—

Winifred D. Cargill, O. F. Conoley, R. A. Mansell, and C. H. H. Robertson.

Diplomas in Psychological Medicine were conferred upon :—

N. A. Albiston, H. E. August, A. A. Bell, Eleanor M. Creak, J. H. Cuthbert, H. S. Forbes, T. R. Forsythe, E. F. Hewlitt, R. M. Macfarlane, J. McGarvey, E. D. T. Roberts, and F. C. M. Taylor.

Dr. T. A. McCullagh, of Bishop Auckland, has been appointed deputy lieutenant for the county of Durham.

STUDY OF VENEREAL DISEASES.—A meeting of the Medical Society for the Study of Venereal Diseases will be held at 11, Chandos-street, Cavendish-square, London, W., on Friday, Jan. 29th, at 8.30 P.M. Papers will be read by Dr. Dorothy Logan and Dr. Violet Russell on the Diagnosis and Treatment of Urethritis and Cervicitis in the Female, and a discussion will follow.

HUNTERIAN SOCIETY.—At a meeting to be held on Monday, Jan. 25th, at 9 P.M., in the Hastings Hall, British Medical Association, Tavistock-square, London, W.C., Sir James Berry will deliver the Hunterian Lecture, on Some Clinical Aspects of Simple Goitre with remarks on its Causation. After the lecture, which will be illustrated by the epidiascope, there will be a discussion in which Dr. Strickland Goodall, Mr. T. P. Dunhill, and Dr. Scott Williamson will take part.

NEW UNION HOSPITAL FOR BARTON.—The Barton-upon-Irwell guardians are to build at once at Davyhulme, near Manchester, a hospital which will be one of the best equipped in the country, and is to be completed in about 18 months. The new buildings will be erected on a site of 23 acres and will cost about £300,000. There will be a maximum of 500 beds available. The medical and clinical appliances include a laboratory for pathological work and an electrical and X ray department, and amongst the amenities will be a single-storey block for healthy children.

GERMAN CONGRESS ON PSYCHOTHERAPY.—In connexion with the Wiesbaden Congress of Internal Medicine, the first general medical congress of psychotherapy will take place at Baden-Baden from April 17th to 19th next. The subject will be dealt with in a comprehensive manner under twelve headings by psychotherapists from Berlin, Vienna, Budapest, Munich, Heidelberg, Bonn, Giessen, Frankfort, Münster, Tübingen, Basle, and Zürich. Scientific contributions for this congress should be addressed to Dr. med. et phil. Eliasberg, Grosshesselohe, Munich, and applications for tickets to Dr. med. Benno Hahn, Maria-Victoria Strasse, 6, Baden-Baden.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee 41 cases were considered and £451 18*s.* voted to 32 applicants. The following were some of the cases relieved :—

M.R.C.S. 1915, M.B. 1922, aged 35, married, three children, aged 9, 6, and 1 year. With army gratuity and savings bought a practice which turned out badly and could not keep up instalments, so he went to moneylenders and eventually became bankrupt. Afterwards, with some £60 which he had left, and a contribution of £50 from friends, started a practice in the Midlands with good prospects. The Professional Classes Aid Council investigated the case and suggested coöperation, with which the Committee agreed and voted £24 to be disbursed by them.

Widow, aged 60, of M.D. Edin. who practised in Wales and died in 1906. Two children: daughter, aged 26, a dispenser earning £3 a week but not living at home, and son, aged 23, with defective hearing, who is unable to get employment. Lives with applicant. Only income £29 per annum, and £10 10*s.* received from letting rooms. Has applied for the Epsom Pension. No rent, but rates amount to £9 per annum. Voted £12 in 12 monthly instalments.

Widow, aged 59, of M.R.C.S. 1891 who practised in England and then went to New Zealand and died in 1905. Applicant and her daughter lived on the £3000 left by the doctor, but £1700 of this was lost by bad investment. Daughter not strong but is nursing in a sanatorium, receiving £2 10*s.* a month. Applicant has had to give up nursing at present owing to bad health. The Committee voted £10.

M.R.C.S. Eng. (St. George's), aged 71, unmarried. Unable to obtain locums owing to age. Suffers from rheumatism. £100 War Loan held by bank against overdraft. Has been in receipt of the Old Age Pension for the past twelve months. Board and lodging 25*s.* a week. Voted £50 in 12 monthly instalments.

M.R.C.S. Eng. 1897 (Middlesex), aged 54, who up to 1923 had a practice in the Midlands and has since taken locums. Unable to get work and since Christmas 1923 has lived on savings, and been helped through the charity of friends. Had to apply recently to the guardians. Rent of room 12*s.* 6d. a week. Voted £9.

Widow, aged 68, of M.R.C.S. Eng. (University College) who practised in the provinces and died in 1890. Applicant has maintained herself ever since, and it is only owing to an accident last August that she has now applied for assistance. She was in bed for 9 weeks. Only income, Epsom Pension £40, and 8*s.* a week from her married daughter; her rent amounts to 10*s.* a week. Voted £18 in 12 monthly instalments.

Daughter, aged 52, of L.R.C.P. 1864 (St. Bart.'s) who practised in the Midlands and died in 1883. Applicant is unable to earn her own living as she has to look after her mother aged 85 who is an annuitant of the Fund. Mother has the Old Age Pension and help from our Guild and our annuity of £30 per annum. The rent is paid by applicant's sister. Voted £18 in 12 monthly instalments.

Subscriptions may be sent to the hon. treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, London, W. 1.

A HOSPITAL ECONOMY.—During the past year the Royal Free Hospital, London, has saved over £500 by washing and resterilising used gauze and bandages.

NORFOLK AND NORWICH HOSPITAL.—The board of management report the "stupendous" annual total of 1275 accident cases, of which 20 a week are motoring casualties. A new children's ward has just been opened.

AT the quarterly meeting of the Directors of the Naval Medical Compassionate Fund, held on Jan 19th, at which Surgeon Vice-Admiral Sir Joseph Chambers, Medical Director-General of the Navy, occupied the chair, a sum of £105 was distributed among applicants.

RICHMOND HOSPITAL ASSOCIATION.—Last week an association was started at Richmond (Surrey) for the benefit of its Royal Hospital, with the approval of the President of the appeal, the Duke of York. Richmond Royal Hospital needs £11,000 a year for its maintenance, but out of a population of 280,000 in the districts it serves only 600 people contribute. The association aims at obtaining members at £1, associates at 10*s.*, and junior members at 5*s.* a year.

IMPROVEMENTS AT CHELTENHAM GENERAL HOSPITAL.—It is proposed to expend £14,000 upon enlargement and improvement. In 1922 £6000 contributed by the British Red Cross Society was devoted to the improvement of the out-patients' department and the provision of a new orthopædic ward. It is now reported that much of the existing X ray installation is obsolete, and that the electro-therapeutic apparatus falls below the present standard. The surgical side for out-patients is very unsatisfactory, and there is no dental room.

CARTER BEQUEST HOSPITAL, MIDDLESBROUGH.—Last week Sir Hugh Bell opened a new hospital provided from a bequest of £40,000 left some 20 years ago by the late Alderman Thomas Carter, a former Mayor of Middlesbrough. Its erection was postponed by the war, and in the meantime the fund accumulated to £100,000. The building, which stands in four acres of land, contains 52 beds, and there will be no resident medical officer. Any medical man may recommend a patient and continue in attendance upon him.

YORKSHIRE CANCER CAMPAIGN.—Viscount Lascelles presided at a meeting held at Leeds on Jan. 18th to inaugurate the Yorkshire Cancer Campaign to establish and equip a cancer research centre for Yorkshire. It was announced at the end of the meeting that the first subscription list had reached £50,000; the sum of £75,000 is required as a minimum. Sir Algernon Firth promised to give £20,000 in addition to the £5000 he has already offered to the University of Leeds towards the erection of a pathological institute in which special facilities will be offered to cancer research students.

COURSES AT MAUDSLEY HOSPITAL.—Two series of clinical demonstrations are at present in progress at the Maudsley Hospital, Denmark Hill, London, S.E. On Wednesdays, at 2.30 P.M., Dr. Edward Mapother demonstrates Functional Mental Syndromes, whilst on Mondays at the same hour Dr. Mary Barkas deals with Mental Disorders associated with Organic Disease and Mental Symptoms and their Genesis. A discussion of cases in the hospital is held in the wards every Tuesday at 11.30 A.M., and there is a monthly meeting on the last Friday of each month at 4.30 P.M. at which a group of patients from one of the L.C.C. mental hospitals is shown. All these clinical facilities are open to medical practitioners and students without fee.

A BRITISH TRUST FOR SPAHLINGER TREATMENT.—It is announced that a Spahlinger fund is to be created by public subscription to finance a British campaign on behalf of the Spahlinger treatment of tuberculosis, and to enable a board of British trustees to take over the Spahlinger estates and laboratory at Geneva, and to produce the necessary sera so that they may become available for use in Britain. The new appeal is to be sent out from Messrs. Brunner Mond's, and is to be made in the first place to employers of labour. In the first instance £40,000 will be asked for, but later a general appeal to the public will be made to raise the fund to £100,000 in order to secure a greatly increased output of the Spahlinger products and to establish an institute in England which would make them generally available to the medical profession. The first trustees of the fund will be Sir Arthur Steel-Maitland (the Minister of Labour), Mr. Tom Shaw, Sir Alfred Mond, and Sir Bruce Bruce-Porter. By private appeals several thousand pounds have already been raised. The first object of the fund is, it is stated, to set Mr. Spahlinger and his colleagues free to carry on their work without financial worries.

CHARING CROSS HOSPITAL INSTITUTE OF PATHOLOGY.—It has been decided to offer to the general practitioner the scientific facilities provided by the Charing Cross Hospital Institute of Pathology at a scale of fees which will bring pathological, bacteriological, and chemical examinations within reach of his poorer patients, and greatly extend his opportunities for the investigation of his more obscure cases. Results will be posted within 24 hours when possible, or in the shortest time the nature of the investigation will permit. Arrangements may be made for patients to be visited in their own homes or to attend the laboratories, the former necessarily involving an increase in the cost. Tubes, pipettes, and other apparatus may be obtained upon request, accompanied by such special instructions as the director of the institute may consider desirable. All reports will be signed by Dr. A. Piney, the director of the Institute of Pathology. The following examples of the scale of fees are taken from the schedule: Quantitative estimation of sugar in blood, 5*s.*; Wassermann reaction, 5*s.*; differential blood count, 10*s.*; histological section, stained and mounted with report, 6*s.* 6*d.*; examination of fractional test-meal, 10*s.* 6*d.*; verification of the presence of tubercle bacilli in cerebro-spinal fluid, urine or sputum, by animal inoculation, 17*s.* 6*d.* All communications and specimens should be addressed to the Secretary, Charing Cross Hospital Institute of Pathology, 62, Chandos-street, Strand, London, W.C. 2.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY, Burlington House, Piccadilly, W.

THURSDAY, Jan. 28th.—4.30 P.M.—*The following papers will be read:*—A. C. Seward: The Cretaceous Plant-Bearing Rocks of Western Greenland. W. L. Balls and H. A. Hancock: Measurements of the Reversing Spiral in Cotton Hairs. R. H. Burne: A Contribution to the Anatomy of the Ductless Glands and Lymphatic System of the Angler Fish (*Lophius Piscatorius.*) (Communicated by Sir Arthur Keith.) I. Gordon: The Development of the Calcareous Test of *Echinus miliaris.* (Communicated by Prof. E. W. MacBride.) *Papers to be read in title only:* F. G. Gregory and L. Batton: A Critical Statistical Study of Experimental Data on the Effect of Minute Electric Currents on the Growth Rate of the Coleoptile of Barley. (Communicated by Prof. V. H. Blackman.) H. M. Fox: Chlorocruorin: a Pigment Allied to Hæmoglobin. (Communicated by Prof. J. Stanley Gardiner.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Monday, Jan. 25th.

GENERAL MEETING OF FELLOWS: at 4.30 P.M.
Discussion on
Hyperpiesis.
Opener:
The Right Hon. Lord Dawson of Penn, to be followed by Prof. F. R. Fraser and others.

ODONTOLOGY: at 8 P.M.
Casual Communication:
Mr. Walter Harrison and Mr. E. W. Lowe: Notes of a Complicated Removal of a Third Lower Molar—Fatal Sequel.
Paper:
Mr. A. W. Wellings: Some Points in the Anatomy of the Capillaries of the Tooth Pulp.

Tuesday, Jan. 26th.

MEDICINE
COMPARATIVE MEDICINE } at 8.30 P.M.
Discussion:
Hodgkin's Disease in Man and Animals.
Openers:
Sir Humphry Rolleston (Medicine)
Prof. Wooldridge (Comparative Medicine).
Other Speakers:
Dr. Morley Fletcher, Mr. W. Horner Andrews, Mr. L. Pugh.

Wednesday, Jan. 27th.

COMPARATIVE MEDICINE: at 5 P.M.
Papers:
Prof. R. H. A. Plimmer: The Relation of Quantity of Vitamin B to Quantity of Food.
Prof. J. C. Drummond: New Facts concerning the Fat-Soluble Vitamins.

Thursday, Jan. 28th.

UROLOGY: at 8.30 P.M.
Discussion on
Pyelography.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Jan. 25th.—8.30 P.M., Discussion on Manipulative Treatment in Medicine and Surgery, to be introduced by Mr. R. C. Elmslie and Mr. W. R. Bristow.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, Jan. 25th.—5 P.M., Sir Arthur Keith: The Taungs Anthropoid: its Zoological and Geological Position.
WEDNESDAY.—5 P.M., Fossil Anthropoids of Europe and of Asia.
FRIDAY.—5 P.M., The Kivu Gorilla and its Bearing on the Problems of Human Evolution.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Jan. 25th, to SATURDAY, Jan. 30th.—Lecture Hall of the Medical Society of London, 11, Chandos-street, W. Thurs., 5 P.M., Dr. H. C. Cameron will lecture on Catarrhs and the Catarrhal Child. This lecture is free to members of the medical profession.—BETHLEM ROYAL HOSPITAL, Lambeth, S.E. Lecture-demonstrations at 11 A.M. Tues., Dr. Porter Phillips: The Psychoses. Sat., Dr. Porter Phillips: Medico-Legal Aspect of Insanity.—NORTH-EASTERN FEVER HOSPITAL, St. Ann's-road, Tottenham. Wed., 2.30 P.M., Sat. 11 A.M., Dr. Frederic Thomson: Demonstration in the Diagnosis and Treatment of the Acute Infectious Diseases.—QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, E. Special course, daily lectures, and demonstrations in all departments.—WEST END HOSPITAL FOR NERVOUS DISEASES, 73, Welbeck-street. Special course in the Diagnosis and Treatment of Common Diseases of the Nervous System. Lecture-demonstrations at 5 P.M. throughout the week.—WESTMINSTER HOSPITAL. Wed., 2 P.M., Mr. E. Rock Carling: Special clinical surgical demonstration. All information as to fees, &c., from the Secretary of the Fellowship.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Jan. 25th.—10 A.M., Surgical Out-patients: Mr. W. E. Tanner. 10.30 A.M., Gynæcological Operations: Mr. A. E. Giles: Throat, Nose and Ear Operations: Mr. W. Ibbotson. 2 P.M., Medical, Surgical, and Gynæcological Clinics, Operations. 6.30 P.M., Venereal Department.
TUESDAY.—2 P.M., Medical, Surgical, Throat, Nose and Ear Clinics, Operations. 4.30 P.M., Mr. E. Miles Atkinson: Acute Infections of the External Auditory Meatus.
WEDNESDAY.—10.30 A.M., Surgical Operations: Mr. E. Gillespie. 2 P.M., Medical, Eye, and Skin Clinics, Operations. 5.30 P.M., Venereal Department.
THURSDAY.—10.30 A.M., Dental Out-patients: Mr. E. S. Pierrepont. 2 P.M., Medical, Surgical, and Throat, Nose and Ear Clinics, Operations. 5 P.M., Operations.
FRIDAY.—10.30 A.M., Eye Operations: Mr. N. Fleming. 2 P.M., Surgical, Medical, and Children Clinics, Operations. 3 P.M., Gynæcological Clinic. 6.30 P.M., Venereal Department.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.C.
TUESDAY, Jan. 26th.—5 P.M., Dr. H. W. Barber: The Erythrodermias.
THURSDAY.—5 P.M., Dr. J. M. H. MacLeod: Pemphigus.

ROYAL DENTAL HOSPITAL OF LONDON SCHOOL OF DENTAL SURGERY.
WEDNESDAY, Jan. 27th.—5.30 P.M., E. W. Fish: The Mouth as a Focus of Infection.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, Jan. 29th.—3 P.M., Mr. Gill-Carey: Diagnosis of Sinus Disease.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.
WEDNESDAY, Jan. 27th.—Dr. Harrison: Reducing Substances in the Urine.
THURSDAY.—4 P.M., Mr. T. Higgins: Hip Cases: A Diagnostic Review.

QUEEN CHARLOTTE'S MATERNITY HOSPITAL, Marylebone-road, N.W.
THURSDAY, Jan. 28th.—5 P.M., Mr. T. B. Davies: Ante-Partum Hæmorrhage.

ST. MARY'S HOSPITALS, MANCHESTER, POST-GRADUATE LECTURE.
FRIDAY, Jan. 29th.—4.30 P.M. (at Whitworth-street West Branch), Mr. J. Morley: Acute Appendicitis in Infants

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINIC.
FRIDAY, Jan. 29th.—3.30 P.M. (at the Royal Infirmary), Dr. Mouat: The Technique of Local Anæsthesia in Minor Operations.

Appointments.

DAVIES, L. MEREDITH, M.D., B.Ch. Oxf., D.P.H., has been appointed Medical Officer of Health for Northamptonshire.
FALCONER, KINLOCH, M.D., Ch.B. Glasg., D.P.H., Medical Officer of Health, Durham Rural District.
HODGSON, J. F., M.D., Ch.B. Manch., D.P.H., re-elected Honorary Surgeon to the Royal Halifax Infirmary.
MILNE, V. E., M.B., Ch.B. Aberd., D.P.H., Medical Officer of Health, Walsall Rural District Council.
POWER, R. W., M.B., B.Ch. Dub., D.P.H., Hon. Orthopædic Surgeon to the Hereford General Hospital.
Willesden General Hospital, Harlesden: WILLIAMS, T. PEARSE, M.D., B.S. Lond., M.R.C.P. Lond., Physician with charge of Out-patients: PHILLIPS, L., M.S., M.B. Lond., F.R.C.S. Eng., Gynæcologist with charge of Out-patients.

Vacancies.

For further information refer to the advertisement columns.

Barnsley County Borough.—Asst. M.O.H., &c. £600.
Bradford Children's Hospital.—H.S. £100.
Brighton, Lady Chichester Hospital for Early Nervous Breakdown.—H.P. £100.
Bristol Eye Hospital.—H.S. £150.
Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. At rate of £75.
Dundee Royal Infirmary.—Hon. Asst. Ophth. S.
Edinburgh, Royal Infirmary.—Two Asst. M.O.'s. £450 and £350 respectively.
Exeter, Royal Devon and Exeter Hospital.—Sen. H.S. £200.
Guy's Hospital.—Phys. for Psychological Med.
Hertford County Hospital.—H.S. At rate of £150.
Hospital for Sick Children, Great Ormond-street, W.C.—Res. Med. Supt. £300.
Hull Royal Infirmary.—Asst. H.P. At rate of £130.
Leeds Public Dispensary.—Sen. Res. M.O. £200.
London Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200.
Manchester, Ancoats Hospital.—H.S. At rate of £100. Also Anæsthetist, 10*s.* 6*d.* each attendance.
Manchester Committee on Cancer.—Special Investigation Officer. £600.
Northamptonshire County Council.—Tuberculosis Officer. £750.
North Middlesex Hospital, Edmonton, N.—Anæsthetist. 2½ gs. per session.
Nottingham General Dispensary, Broad-street.—Res. Surg. £250.
Nottingham General Hospital.—H.S. for Ear, Nose and Throat Dept. At rate of £150.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Cas. O. At rate of £100.
Rochester, St. Bartholomew's Hospital.—H.P. At rate of £200.
Royal Northern Hospital, Holloway, N.—Asst. Surg. O. £150.
Southampton, County Borough Isolation Hospital.—Res. M.O. £360.
Sudan Medical Service.—Four M.O.'s. £E.720.
Ventnor, Isle of Wight, Royal National Hospital for Consumption and Dis. of Chest.—Jun. Res. M.O. At rate of £250.
Warrington, Lancashire County Mental Hospital, Winwick.—Deputy Med. Supt.
West London Hospital, Hammersmith, W.—Asst. Path. £250.
Wilts County Council, Venereal Diseases Clinic, Swindon.—Part-time M.O's. £1 11*s.* 6*d.* per session.
Wolverhampton and Staffordshire Hospital.—H.S. At rate of £150.
Worcester General Infirmary.—Jun. Res. M.O. £120.

The Chief Inspector of Factories, Home Office, London, S.W., announces vacant appointments for Certifying Factory Surgeons at Newport, Yorks, E. Riding; Insch, Aberdeenshire; and at Cumbernauld, Dumbartonshire.

A vacancy for a Medical Referee under the Workmen's Compensation Acts (Northern Ireland), 1906 to 1923, is announced. Application should be made to the Secretary, Ministry of Labour, 7, Upper Queen-street, Belfast, not later than Feb. 6th.

Births, Marriages, and Deaths.

BIRTHS.

CROOK.—On Jan. 18th, 1926, at 15, South Eaton-place, London, S.W., to Elizabeth, wife of Eric A. Crook, F.R.C.S.—a son.
PORTEOUS.—On Jan. 13th, at Glencoe, Lower Common South, S.W., the wife of A. B. Porteous, of a son.
POTTINGER.—On Dec. 13th, 1925, at Poona, India, the wife of Captain D. Pottinger, R.A.M.C., of a son.
SHEARWOOD.—On Jan. 17th, at Normanton-road, Derby, the wife of Dr. A. L. Shearwood, of a daughter.

MARRIAGES.

HOLLOWAY—DIXON.—On Jan. 9th, at St. Andrew's Parish Church, Shoebury, Norman Maberly Holloway, L.D.S. R.C.S., to Barbara Mary, only daughter of Mr. and Mrs. Timothy Dixon, of Thorpe Bay, Essex.

DEATHS.

BLOXAM.—On Jan. 12th, John Astley Bloxam, F.R.C.S., J.P., of The Old Malt House, Bourne End, Bucks, aged 82 years.
HALL.—On Jan. 12th, suddenly, at Park View, North Park-road, Bradford, John Basil Hall, J.P., M.Ch., F.R.C.S.
HODGSON.—On Jan. 12th, at the Samaritan Hospital for Women, Dorothy Margaret Hodgson, M.R.C.S., L.R.C.P., the wife of Dr. R. G. K. Hodgson, of Andover, Hants, aged 29.
MACLEAN.—On Jan. 15th, at Balham High-road, S.W., James Newlands Maclean, M.B., C.M. Glasg., aged 62.
WILSON.—On Jan. 13th, at a nursing home in Liverpool, Frederick Perera Wilson, M.D., of Rodney-street, Liverpool, and Windbourne, Freshfield, Liverpool, aged 49 years.
WOOD.—On Jan. 14th, at Waverley-road, Enfield, Edward Wood, L.S.A., M.R.C.S., L.R.C.P.

*N.B.—A fee of 7*s.* 6*d.* is charged for the insertion of Notices of Births, Marriages, and Deaths.*

Notes, Comments, and Abstracts.

SMALL-POX AND VARIOLATION IN A VILLAGE IN PALESTINE

IN DECEMBER, 1921.

[ABRIDGED.]

BY JOHN MACQUEEN, M.B., C.M. EDIN.,
DEPARTMENT OF HEALTH, JERUSALEM.

VARIOLATION is the inoculation of individuals with variolous matter from the vesicles of a person suffering from small-pox, with a view to protecting them from the disease. In India there was a special worship defined in the Atharvaveda, and special prayers were to be said by the Brahmins when performing the operation of inoculating the virus. It was almost certainly known when the Charaka Samhita and the Susruta Samhita were written. In Africa Ruffer and Fergusson found an eruption on the skin of a mummy belonging to the period 1200 to 1100 B.C., which was suggestive of small-pox. It was apparently introduced into America by the Spaniards and by slaves brought from Africa.

For the study of the spread of small-pox recently in countries surrounding or connected by trade routes with Palestine, the returns from Paris, Constantinople, Egypt, and the League of Nations were available. What is of most interest is the connexion of the disease with the Moslem pilgrimage to Mecca in 1921. The Palestine pilgrims were detained at the quarantine station at Tor on the Red Sea, and arrived back in the country about Sept. 9th. The medical officer who had accompanied them reported that there had been ambulant cases in Mecca. In Dawaimeh village there had been no cases since the war, but the villagers stated that there had been three epidemics during the last 50 years. Certainly numbers of them were pock-marked.

The Turks performed vaccination spasmodically. They employed vaccinators for this purpose, and Palestinian doctors think that about 10 per cent. of the population of the country were vaccinated in this way. In Dawaimeh a much larger proportion than this had been variolated in their youth. Indeed, the majority still show the scar of this operation on the web between the forefinger and thumb.

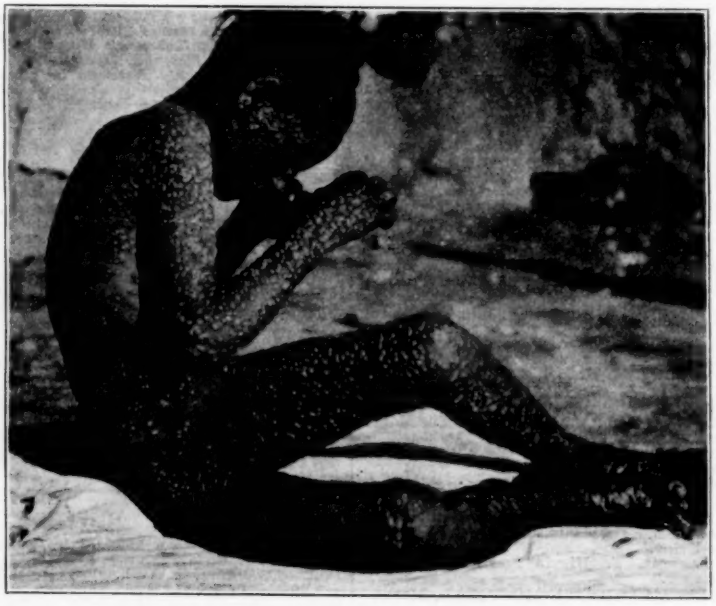
History of Inoculation.

It is worth while recalling the story of the introduction of variolation into Western countries. Lady Mary Wortley Montagu saw and learned the method in Constantinople in 1717, and had the operation performed on her son. She described it in a letter to a friend in England, where it soon became popular and eventually spread from there to Europe and America. The procedure in Turkey was to remove the contents of a vesicle (not a pustule), preferably the vesicle of an inoculated case, and introduce it by means of an abrasion, incision, or puncture. Rosenau describes the Chinese method as follows: "They inoculate usually by plugging the nostrils with cotton previously saturated with a mixture of water and pustular crustaceous matter taken from the eruption of a small-pox patient; less commonly by blowing the crushed fresh crusts into the nostrils through a bamboo pipe." Inoculation as performed in Britain is described by the late Dr. C. B. Ker: "Clear lymph from the vesicle preferably of an inoculated case was inserted by means of a lancet into the skin of the upper arm. Four days later papules appeared at the site of inoculation and formed pustules on the seventh day. There was fever and subsidiary pustules round the site of inoculation, and on the eleventh day the temperature fell and a generalised eruption appeared on the other parts of the body and ran a normal if somewhat rapid course." The discussion on the relationship of cow-pox to variola is age old, the established view being that cow-pox is small-pox modified by transmission through the cow. Goat-pox is comparatively common in Palestine.

The Epidemic in Dawaimeh.

Dawaimeh lies among the western foothills of the Judean range, a four hours' ride in a direction west by south from Hebron. Its people are strong and healthy and well-suited for the pursuit on which a large number of them depend for a livelihood, for they are thieves of considerable distinction. It is told of them that during the war a troop of Turkish cavalry visited their village when touring the country to commandeer horses for the army. Their commander told the mukhtar of Dawaimeh that the village must provide ten by the following morning, otherwise the place would be burnt down. Next morning they were duly handed over to the Turks. It was not until they had the whole heat of a day's march between themselves and the mukhtar and arch-chief of Dawaimeh that they realised that their total number of horses had not been increased by a single animal. Hussein had caused his minions to steal ten horses from them during the night, and had presented them with a similar number in the morning! This story somewhat consoled me, because I had visited Dawaimeh on Dec. 19th, stayed the night with Hussein, seen the original case of small-pox, satisfied myself with regard to the measures being taken and that there were no further cases there, when all the time there were hidden in the village and surrounding caves over 300 children who had been variolated. Most of these must have had wounds at the site of inoculation at that time, a considerable number had already developed an eruption, many were very ill, and a few had almost certainly died. The original case, a negress servant of Hussein's, was first seen by a doctor on Dec. 13th, 1921, and was already in the pustular stage. She was isolated in a tent some distance from the village, disinfection was carried out, and vaccination begun. No more cases were discovered, and for some days all appeared to be going well. But the mukhtar had enemies, who made it known that a few days before the case of the negress had been reported the village "doctor" Shaheen had, with the sanction and encouragement of the mukhtar, successfully inoculated from the original case no less than 300 children. Too successfully indeed had he done his work. One-half of the 300 children were said to have developed an eruption, many were seriously ill, some had died, and cases of true small-pox contracted from those inoculated were beginning to make their appearance. Energetic steps had to be taken. A hospital was established in the mukhtar's house and staffed by a doctor, staff nurse, two probationer

FIG. 1.



Showing distribution of rash in a bad case.

nurses, tamurgi, cook, and male servant. The work of vaccination was pushed on, and in a short time most of the inhabitants had been vaccinated.

Some difficulty was experienced at first. A systematic house-to-house search was instituted. On making an inspection of this sort it is not sufficient merely to enter a house and take the names of those present. The caves, corn bins, tibbin heaps, nooks behind piles of sticks, roofs, gardens, and every hole and cranny had to be searched, and many amusing finds were made.

The first lymph which was used proved quite unsatisfactory, only 172 out of 2754 vaccinations showing positive results, and several children developed true small-pox. Fig. 1, taken by Dr. Ayoub from one of those, shows excellently the distribution of the rash. Fresh lymph was obtained from the Government of Egypt, and the difference was quickly apparent. The natives themselves were struck by its greater potency and came forward readily enough even to be done a third time. "It would take on a stone" they said. Vaccination with the "Cairo" lymph marked the turning point in the campaign. No person who was protected thereby developed small-pox. Later a vaccination campaign throughout the whole country was undertaken, and at present it is safe to say that no serious outbreak of small-pox is likely to occur during the next five years.

The Inoculated Cases.

Shaheen is a distinguished-looking gentleman of over 50 years of age. Fig. 2, which shows him at work, was taken after his discharge from Hebron prison, where he spent a month as a result of his misguided efforts to limit the spread of the disease. He was the village medicine-man, as had been his father and grandfather before him. In the neighbouring villages and even amongst the Bedouin of the plains to the south he was held to have skill and experience in his profession. His reputation was by no means lessened but rather considerably enhanced by his performance at Dawaimeh and subsequent imprisonment.

Shaheen's method was as follows: As "lancet" he employed the thorns of a shrub (Fig. 3) common in the district. He peeled the thorns with his thumb nail and with this fairly sharp-pointed, useful little weapon he removed the cuticle of a vesicle or pustule of the original case and spread some of the contents on the skin on the back of the web between the forefinger and thumb of the right hand. He then made three little punctures with the

FIG. 2.

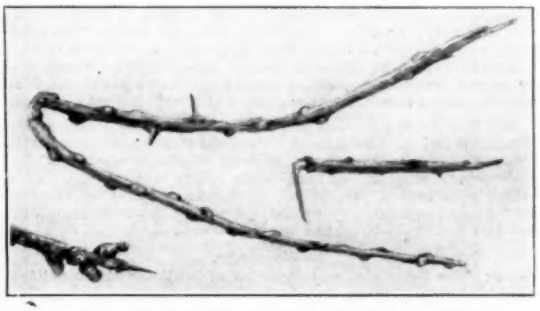
Shaheen at work.

horn point through the variolous matter and skin on which it was spread. After this the thorn was drawn across under the nostrils. This was done, so Shaheen said, in order that the emanation from the variolous matter might be inhaled with the breath and so doubly inoculate the victim. Shaheen told us that when he did not draw blood his inoculation took better. He also told us that he used to conserve his vaccine so that he could inoculate even when he had not an actual case to work from. This he did by rubbing a piece of cloth over the pocks, thus breaking them down and soaking the cloth in variolous matter. The cloth was kept in a bottle full of water which dissolved out the variolous matter and this could be used later as vaccine, or it was allowed to dry and preserved thus. It lasted, he said, for years. His charge for vaccination was an egg or two. Most of the children inoculated were between 1 and 3 years of age, but one was 6 months old and another 8 years. Shaheen was averse to doing children under a year. The wounds produced at the site of inoculation were either punched-out sores big enough to put the top of the little finger into for half an inch, or like ordinary septic sores with scabs on them when I saw them.

Variola Inoculata.

It was difficult to obtain a reliable account of the course of symptoms following inoculation, and we were too late on the scene to observe these ourselves. Roughly it took from four to eight days between inoculation and the appearance of the eruption. Towards the end of that period the patients suffered from malaise, indefinite pains, and loss of appetite. Headache and vomiting, generally present in

FIG. 3.



Thorn of the kind used by Shaheen for inoculating.

true small-pox, were not complained of markedly, nor did they say that they had rigors, but stated that fever was present when the eruption appeared. The latter went through the stages of papule, vesicle, pustule, and crust just as in small-pox. Some of the patients were severely ill and out of 116 who had the eruption ten died. The legs, hands, and arms were chiefly affected, as in true small-pox. Most showed from 1 to 25 pocks, but 23 per cent. of cases showed over 200 pocks. This indicates the potency of the strain of virus used by Shaheen, and this is further borne out by the fact that death occurred in 8·6 per cent. of the cases showing eruption and 3·3 per cent. of the number inoculated. The case-mortality in the last epidemic of small-pox in England was about 3 per cent., but in the unprotected it is, of course, much higher than this. The pitting produced by the pocks was less deep than in that of true small-pox. The death-rate for cases inoculated, 3·3 per cent., could not have been so high when the practice was common in England.

It occurred to me that it would be interesting to vaccinate some of the children whom Shaheen had inoculated. Accordingly 27 of the cases which had been inoculated by Shaheen and developed an eruption a year previously were vaccinated. Twelve out of the 27 children vaccinated gave a positive result (roughly 50 per cent.). There is no doubt that if one vaccinated a year later 27 children who had had true variola nothing like that proportion would have been successful.

In general variola inoculata is a mild disease. The death-rate in cases inoculated must have been, I should think, considerably less than 1 per cent. or it would not have gained such popularity after its introduction into England and America. The Dawaimeh cases were much more severe—it is difficult to say why. The climate is mild. Sepsis was not sufficient to account for the high death-rate, and the people are strong and healthy. Shaheen evidently struck a particularly virulent strain of virus.

Why is Variola Inoculata Milder than Variola Vera?

That variola inoculata is generally a mild disease, whereas variola vera is a severe one, is possibly due to the fact that the virus, when introduced under the skin, finds itself in an unfavourable medium for propagation. The Chinese method of inoculating small-pox by blowing the crusts into the nose through bamboo pipes also produces a much milder disease than variola vera. Inhalation would not therefore appear to be the normal route of the infection. Neither probably is ingestion, because in the Chinese method it is bound to have taken place in almost every case.[1] Why is it that small-pox when it spreads naturally by contagion or fomites is so much more severe than when

[1] Since writing this paragraph I have seen it stated in a French journal that the Armenians were in the habit of producing variola inoculata by eating raisins into which had been pushed the dried crusts of variolous lesions.

inoculated subcutaneously or by blowing into the nose. It is easy to make suggestions. The possibility of an intermediate host in which the virus undergoes development presents itself. But diseases, in the spread of which an intermediate host plays an essential part, do not spread by direct contact. The virus may be spore-forming. But if this were the case Shaheen's dry preserved "vaccine"—that is, cloth soaked in the contents of variolous vesicles, allowed to dry and kept for a long period—would contain the spores, and would therefore be as potent as true small-pox. The same would apply to the Chinese method of inoculation by blowing the dried crusts into the nostrils. These various operations must have been much milder in their effects than true small-pox, otherwise they would have lost their popularity. Shaheen and his Dawaimeh epidemic will, however, have served some useful purpose if it is only to remind us that a "disease" called variola inoculata was once extremely popular, that it took a very fine observer, Jenner, to supersede it with a better "vaccination," and to set us wondering again why small-pox is such a severe infection when acquired naturally, so much less so when its propagation depends on inoculation, and so wonderfully harmless when passed through the calf.

My thanks are due to Mr. R. O. Sibley, late chief of the Epidemiological Section of the Department of Health in Palestine, and to Mr. G. W. Stuart, who is in charge of the Laboratory Section, for their suggestions and advice, to Mr. Sibley's successor, Mr. W. J. P. Harkness, and to the two doctors, Ayoub and Mossauba, on whose devoted shoulders fell the heavy load of the routine work.

Bibliography.

Osler: The Principles and Practice of Medicine, 1912 edition.
J. A. Mitchell: Small-pox and Amaas in South Africa, THE LANCET, 1922, ii., 808.
Infectious Diseases: C. B. Ker.
Manual of Tropical Medicine, Castellani and Chalmers, 1907 edition.
Preventive Medicine and Hygiene, Rosenau, fourth edition.
Infectious Diseases Returns, 1921-1922, Department of Health, Government of Palestine.
Bulletin de l'Administration Sanitaire des Frontières, Constantinople, 1921–1922.
Office International d'Hygiène Publique, Bulletin mensuel, 1921–1922.
Rapports Epidémiologiques (Mensuels et Spécials) de la Section d'Hygiène de la Société de Nations, 1921–1922.
Infectious Diseases Returns, Government of Egypt, 1921–1922.
Infectious Diseases in Animals Returns, Government of Palestine, 1921–1922.

THE DOCTOR'S CAR: AN INCOME-TAX SNAG.

UNDER the Finance Act of 1925 a professional man is entitled to claim a deduction from his income-tax for the wear and tear of the car he uses in his work. Several practitioners who applied for this, however, found that they were worse off than if they had refrained, for the assessor, turning up their returns of the last three years, discovered that they had claimed "replacement" when they bought their cars. This allowance he added back, on the principle that they could not eat their cake twice over, and the resulting jump in their average was considerably larger than the amount they were claiming for wear and tear. To take a fictitious but typical example: a doctor buys a car in 1922 for £350, and has this sum allowed him free of tax as a necessary "replacement." In 1925 he claims for wear and tear at 20 per cent. of the written-down value at the beginning of the year, which, allowing 20 per cent. depreciation per annum, will be in the neighbourhood of £45. When the assessor adds back the £350, his average will go up by one-third of this—£117. It would not be much better if the car were only a year old, for a fifth can never equal a third. This is true for all first cars, but when the new car is really a replacement, and has cost more than the amount allowed by the Income Tax Department (cost of old car less sale price) it may be worth the doctor's while to claim. A doctor, for instance, wants to replace his Morris-Cowley, which cost him £280 three years ago, by a car costing £800. He sells the Morris for £91 and is allowed £189 for the replacement. If at the end of the first year he claims £160 wear and tear on the new car, and the £189 is added back, he will get off £160 minus £63; £97.

The owner should, therefore, decide before making his claim which he would rather do, claim or wait. If the car was bought in 1922 it will be out of the picture in the 1926 assessment anyhow, since 1922 is not one of the years on which his average is calculated, and he can claim. If in 1923, then he would do better to waive his claim this year, unless it cost him so much more than his "replacement" allowance that he gains on it. The problem is intimately bound up with the actual depreciation the car undergoes, but it certainly looks as though the "replacement" rebate, when it covers the whole cost of the new car, were more worth having than the diminishing wear and tear allowance. The best plan of all would be to get a really good car that would last for years with little depreciation. Waiving the wear and tear claim for three years, the owner would then start claiming depreciation on the actual value of his car, calculated not on three years' depreciation at 20 per cent. each, but at the average market price of similar cars. This means, however, a second-hand Rolls or Bentley, which comparatively few can afford. The trouble is that only a really first-class car will actually depreciate at less than 20 per cent. per annum, in spite of the claims of other manufacturers. The car should be a year old originally to avoid the heavy depreciation of the first year. 25 per cent. is the minimum market-price of a car's virginity.

THE GOLF SWING.

DURING what a humorous custom insists shall be called seasonable weather, the golfer must perforce lose many hours of priceless time, but he need not waste them. He may remember and repent of his sins of the past summer and autumn; and he may seek inspiration for the coming spring. Should he belong to the class of hopeful duffers, we recommend to his notice a book by Dr. James Forrest[1] who by the study of moving pictures, has arrived at very definite ideas about the golf swing. Particularly has he analysed the illusive "wrist action" beloved of golf instructors. The thesis is presented clearly and well and is illustrated by a series of excellent photographs. His theory appeals to us; we have practised it indoors, and, making proper allowances for the restrictions imposed by furniture and electric light fittings, it seems to work. It will be interesting to see how it behaves on the links.

WHITE WINE ANAPHYLAXIS.

ALTHOUGH wine is responsible for many evils, few would suspect it of containing albuminoids; nevertheless, the experiments of MM. Spillmann and de Lavergne at Nancy, reported in a recent issue of the *Presse Médicale* (1925, No. 81), show conclusively that the cheaper brands of white wine will produce as unpleasant an anaphylactic rash as pork, lobster, and strawberries. Their first subject was a "polyvalent," to whom eggs, bacon, strawberries, and many kinds of fish were poison, and he had already discovered this property of white wine for himself. Red wine, vintage white wine, and champagne were harmless, but a glass of "petit vin" would bring out a rash on his arms and back with the utmost regularity. His discovery was verified in hospital, and in skin-reaction tests checked by controls. White wine, together with egg-yolk, sardine, and bacon, produced a papulo-pruriginous eruption in a quarter of an hour. He was insensitive to ovalbumin and horse serum, and to several other substances that commonly produce anaphylactic symptoms. The controls gave uniformly negative results for all these substances. The explanation is interesting. It appears that red wine contains a large amount of potassium bitartrate, the gradual precipitation of which clears it, but white wine will not clear unless it has added to it a quantity of some kind of glue. Wine merchants are very careful to use in champagne and vintage wine only the minimum quantity necessary, but with cheaper brands one middleman after another may add glue to the same barrel of wine. The substances in use are fish-glue, gelatine-glue, blood-glue and white of egg, as well as certain compositions, and the proportion in the wine may reach one-half of 1 per cent. The blood-glue by itself gave positive anaphylactic results in guinea-pigs, but the wine did not, presumably because the few cubic centimetres injected did not contain an appreciable amount of glue. The fact that a glass of the same wine on an empty stomach cleared up the rash that it had brought out when it was taken with food suggests a justification for the otherwise deplorable apéritif habit. The common reaction of the patient and the two controls to the external application of red wine is reminiscent of the current experiments of Widal on the relative liability of various wines to produce gout. Although this reaction bears all the marks of an anaphylaxis there is no easy explanation of albuminous glue or the like. The offensive constituent in red wine remains an unsolved mystery.

Messrs. Reynolds and Branson, Ltd. (13, Briggate, Leeds), in issuing a wholesale price-list dated January, 1926, call attention to an addition of 15,000 square feet to the floor space of their factories for the manufacture of surgical and scientific instruments, pills, and tablets, and five excellent full-page photographs are given of their present equipment. They announce an arrangement made at 14, Commercial-street, Leeds, for giving demonstrations with ultra-violet light, X ray and other electrical apparatus, including a new pattern of quartz mercury lamp to use current direct from the main, whether alternating or continuous.

[1] The Basis of the Golf Swing. By James Forrest, M.B. London: Thomas Murby and Co. 1924. Pp. 60. 6s.